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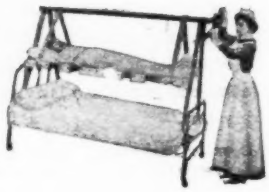

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Hunterian Lecture

ON

GUNSHOT WOUNDS OF JOINTS, THEIR PATHOLOGY AND TREATMENT.

Delivered before the Royal College of Surgeons of England on March 2nd, 1917.

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MR. PRESIDENT AND GENTLEMEN,—I beg that you will accept these observations as suggestions, based on the somewhat scanty pathological data at our disposal and an experience necessarily incomplete, rather than as ordered statements of surgical law resulting from a comprehensive study. My personal impressions have been gained almost entirely from field ambulance and casualty clearing station work in France and Belgium, and my remarks are therefore subject to correction by those who have a more intimate knowledge of the later course and treatment of these lesions. At the same time one wishes to emphasise the supreme importance of an adequate treatment of wounds at the earliest favourable opportunity.

Since the progress of joint wounds has been far from satisfactory and radically different lines of procedure have been advocated, it would seem profitable at this stage of our experience to consider all the pathological data at hand in the hope of rationalising treatment in general and controlling that of individual cases. Unfortunately, the scientific facts available are insufficiently complete to place any definite system beyond the range of debate. It remains to utilise them in a critical examination of the various practices in vogue, and otherwise to formulate a working basis on the ground of clinical observation, guided by an ever-present recognition of military limitations and resources.

PATHOLOGY.

A joint directly wounded is subject to infection from two sources, the projectile itself and the track of the projectile from the exterior. When present, the former varies in degree of virulence from the comparatively clean undistorted rifle bullet to the irregular shell fragment enwrapped in muddy clothing and loaded with bacteria. Infection may also spread to a joint from neighbouring wounds, either by way of the soft tissues or along a fissure in a fractured bone. Joints are generally agreed to be peculiarly susceptible to infection; in civil practice a surgeon tends to take more precautions in opening a joint than any other cavity, whilst it is significant that joints are early affected in most pyæmic conditions. Although the signs of inflammation are less obvious in wounded joints on account of the usual outlet for excess of fluid and consequent relief of tension, the frequency of disaster is at least as great. An environment conducive to the well-being of micro-organisms obtains; the synovial cavity presents a sac comparatively free from air and a plentiful supply of desirable medium; on the other hand, it is probable that the arrangement of the blood-supply, the anatomical formation of the synovial cavity with its various complexities, and the viscidity of the fluid may hinder the excursions of the polymorphs and the free circulation of lymph on which the inflammatory processes depend for success.

What powers has a joint of combating bacterial invasion? *That there is a very considerable reactive mechanism has been demonstrated* by Lazarus-Barlow, Delbet, and other observers. A foreign body in a joint, possibly lodged in bone, may be covered with micro-organisms; the surface of the osseous cavity in contact with the projectile and the edges of the wound in the synovial membrane also are infected; but it is with the greatest rarity that the synovial fluid and blood effused into the joint exhibit bacteria within the first 24 hours. According to Lazarus-Barlow, a large proportion of fluids show no organisms in films or on culture, even at a much later period. Blood withdrawn from a wounded joint at a very early stage contains excess of leucocytes. This question of leucocytosis may be examined more closely, as it has a practical bearing on prognosis and treatment. Generally speaking, an aseptic lesion is associated with a mononuclear leucocytosis and a septic lesion with a polynuclear leucocytosis; moreover, the latter varies to a certain extent with the potency of the infection. Hence a differential count of the leucocytes and red cells in the synovial cavity of a wounded joint, together with an estimate of the total number in the effusion, enables one to classify roughly the severity of the infection and forecast a prognosis accordingly (Lazarus-Barlow). The method of "pyoculture" is said by Delbet to afford a more accurate estimate in the same direction, as it indicates directly the presence and relative virulence of bacteria with greater delicacy than the usual cultural methods.

Various micro-organisms have been found in wounded joints; their exact nature does not appear to bear any definite relationship to the clinical issue, except in the case of streptococcal infection where the prognosis is bad.

When the wound is accompanied by fracture, as occurs almost invariably in joints other than the knee and occasionally the shoulder, the outlook is definitely more serious, as the phenomena of osteomyelitis in some degree may be imposed on those of joint infection pure and simple.

Anatomically, the following forms of joint wound may be recognised:—

1. Wounds in which the articular lesion merely represents an element of a wholesale destruction of the limb in the neighbourhood of the joint.

2. Articular fractures proper, including the majority of joint wounds. A projectile may be present in the synovial cavity or in the adjacent bone; or, having passed through the joint, it may be arrested in the ligaments or the soft tissues outside. The types of fracture are numerous; one or more bones may be affected. (*a*) An impression or gutter in the articular or non-articular surface of the bone is made by the projectile in passing. (*b*) The projectile is embedded in the surface of the bone; fissures may radiate from the osseous cavity. (*c*) The projectile has passed through the bone with or without fissuring. The latter possibility is only likely to be realised where the cortex of the bone is thin, as in the lower extremity of the femur. Where the compact layer is thicker, as in the upper end of the tibia, penetration is almost invariably accompanied by fissures. (*d*) The projectile is lodged in the substance of the bone forming a cul-de-sac with or without fissuring. The latter condition is again dependent on a lack of thickness in the shell of compact bone. (*e*) One or more fragments of bone of varying size, from a small splinter to a large block such as a femoral condyle, are separated with or without dislocation. (*f*) Fissures pass for a considerable distance into the shaft of the bone. (*g*) There is much comminution of one or more of the osseous extremities.

3. Penetrating wounds of the joint without fracture, in which the projectile may or may not remain in the synovial cavity.

Classes 2 and 3 include a definite and common type of wound, usually due to a rifle bullet, in which the projectile has passed through the joint, inflicting tiny wounds of entrance and exit, with or without fracture.

In many cases it is difficult to decide on anatomical grounds whether the synovial cavity has been penetrated or not—e.g., through-and-through wounds of the front of the thigh in the neighbourhood of the supra-patellar synovial pouch, or wounds in which the foreign body has been arrested in the ligaments before entering the joint. An effusion into the joint commonly occurs in these cases.

A fissure may reach the articular extremity of a bone from a fracture originating outside the joint, in which case there is an additional danger of infection when the foreign body remains lodged in the shaft at the site of fracture. On the contrary, a projectile entering the bone outside the joint may pass into the articular extremity and lodge there without causing a break of the actual articular surface.

TREATMENT.

General Considerations.

Apart from the nature of the joint wound itself, it is essential to take into account certain other factors of importance in deciding on a line of treatment.

The condition of the patient may be profoundly influenced by shock or, at a later stage, by toxæmia. Either of these may result from the wound in question or from wounds in other parts of the body. Shock may prohibit an operation otherwise indicated; toxæmia of marked degree may precipitate an amputation. Injury to neighbouring parts—e.g., the popliteal artery in the case of the knee, or the chest in the case of the shoulder—may render the articular wound of secondary importance and modify accordingly the treatment.

The age of the wound is a factor of the greatest importance. Given the necessary conditions, the earlier the primary or prophylactic form of treatment is applied the better. During the first 24 hours there is ample evidence to show that the sources of infection tend to be limited to their original foci. After this period there is less possibility of complete eradication. At the same time, it is an unjustifiable procedure to open a joint under unsatisfactory conditions as regards asepsis; a further delay, if not too prolonged, affords the lesser evil. Professor Tuffier, who has great experience in this subject, tells me that he has recently had results almost uniformly favourable from operations performed as late as the third day after receipt of the injury. To perform any considerable operation on a joint requires a surgeon of some judgment and ability, not too pressed for time, a well-equipped theatre, and a preliminary X ray examination. It is further desirable that there should not be urgent need for transport immediately after operation. These conditions are usually fulfilled at a casualty clearing station, but not during periods of high pressure. *A strictly conservative line of treatment is preferable to half-hearted operative measures.*

In planning treatment, even in the earliest stages, one should have in mind a higher ideal than that of merely saving life or limb. *Consistent with the patient's general safety, every effort must be made to anticipate unnecessary orthopædic disability.*

Observations on the treatment of joint wounds in general apply more particularly to wounds of the knee. Reference will be made later to peculiar features in the treatment of individual joints.

Preliminary Treatment.

Immobilisation is the most important measure in the early stages. The sooner the joint is immobilised the better: a splint or other improvised fixation apparatus should be applied whenever possible at the aid-post, if not before, and at the field ambulance invariably. The objects are obvious: in the first place, unnecessary shock and hæmorrhage are obviated by fixation of the limb during the first stages of transport; secondly, infection is limited. Not only does movement tend to spread infected particles throughout the cavity, but it may cause infection of a previously unaffected joint from a focus outside the synovial membrane. Beyond this immobilisation and the application of ordinary dressings, one would suggest that no further treatment should be applied to the joint as such until the patient reaches a unit equipped for any necessary operation. It is important, however, that he should reach this unit at the earliest possible moment.

Expectant Treatment.

There is a large class of cases in which the evolution of the wound is so habitually favourable as to render any form of primary arthrotomy unjustifiable; although it may be necessary to remove an extra-articular source of infection. Even the most radical school of joint surgery admits that the *in-and-out type of wound with punctiform cutaneous apertures of entrance and exit has a very good prognosis.* The projectile, an undistorted rifle bullet or a very small shell fragment, has presumably introduced into the joint an inconsiderable amount of infective material of which it has carried away the greater part on leaving. The internal source of infection is thus reduced to a minimum; there is practically no communication with the exterior. The joint can adequately deal with the situation apart from operative interference. Even if there be an osseous lesion it may be regarded as a simple articular fracture. The essential steps of treatment are a careful cleansing of the skin around the wounds and a rigid immobilisation of the joint. There may be a considerable effusion into the synovial cavity; to aspirate this at an early stage is potentially dangerous, since infective matter may be sucked into the joint by the procedure. Moreover, the accumulation tends to recur, and is possibly beneficial as a reactive product. The injection of antiseptics such as ether or formalin glycerine emulsion has been advocated, but it would seem more reasonable to avoid any form of interference with the natural mechanism on which the expectant form of treatment essentially relies.

More debatable is the treatment of those *cases in which a rifle bullet or tiny fragment of shell has lodged in the substance of an articular extremity after passing through the synovial cavity, creating an insignificant wound of entrance and no obvious fissuring of bone.* As before, there is practically no danger of infection from without, and although there is a definite source within, the nature of the projectile renders it comparatively innocuous. If the foreign body is so situated as to render its removal more than usually difficult without considerable derangement of the joint and enlargement of the osseous track, the risks of operation are greater than those of retention. But if the body be more readily accessible the balance turns in favour of a primary operation.

An essential feature of expectant treatment is a constant supervision of the clinical course of a case supplemented by pathological examinations of the fluid of the joint. In this way, adverse signs are detected at the earliest opportunity should the necessity for more active measures arise.

Extra-synovial wounds, whether of the soft parts or of bone, are treated as soon as possible by removal of foreign bodies, thorough excision, Carrel's tubes, &c.; arthritis may thus be obviated even though a fissure radiate from the focus of an osseous lesion to the joint. Frequently an articular effusion accompanies these neighbouring wounds; primary arthrotomy is not on that account indicated. Strict immobilisation is essential.

Primary Operative Treatment.

In all classes of joint wound other than the foregoing there is at least one potent source of progressive infection which demands removal at the earliest opportunity. This may be a foreign body, an infected cavity of bone, a synovial wound open to infection from without, or all three combined. *A priori*, it would seem highly desirable to perform the necessary operation at the earliest favourable opportunity. In fact, experience has shown that *this prophylactic form of treatment is most reliable when applied within the first 12 hours*, although its value is by no means limited to that period. The following measures are included under this heading:—

1. Excision of external wounds and suture of the synovial membrane.
2. Arthrotomy, followed by (*a*) removal of foreign matter, blood clot, infected edges of synovial membrane; (*b*) treatment of osseous cavities and removal of fragments of bone ("esquillectomy"); (*c*) suture.
3. Partial or complete resection of the joint.
4. Amputation.

Cases in which there is a lesion of the soft parts more extensive than the punctiform wounds of a former class, but little or no bony defect; and in which the joint contains no foreign body.—These are treated by careful excision[1] of the wound as far as the synovial membrane; the edges of the latter are excised also, and blood clot is expressed from the joint. Lavage of the cavity and the injection of antiseptics is a doubtful proceeding in these cases, where the object of treatment is to prevent further infective material from entering the joint and otherwise to rely on natural resistance. The gap in the membrane is completely sutured with catgut if possible.

The external wound is treated by simple drainage, Carrel's method, or salt packs. In excising the track it is advisable to make it more or less cone-shaped, thus facilitating outward drainage. The application of an antiseptic, such as ether or brilliant green, supplements the mechanical disinfection. Primary suture of the whole track implies unusual success in antisepsis, as it necessarily risks a secondary infection of the joint.

When the gap in the synovial membrane is too large to be completely sutured the prognosis is less favourable, as the danger of reinfection remains. It is often possible to close the joint by suturing into position a flap of ligament or fascia free from infection, and partially separated from the tissues in the neighbourhood by an incision which does not eliminate its blood-supply. Failing this, excision of the wound is followed by Carrel's treatment or merely by the application of aseptic dressings (the latter not to be removed apart from definite indications). On no account should drainage-tubes be introduced into the joint at this stage; they increase very definitely the danger of infection from without, and serve no useful purpose.

Cases in which the joint contains a foreign body with or without fracture; and cases in which comminution of bone is associated with an open wound of the joint.—In these there is a focus of infection within the joint; there may be a path

[1] The routine excision of wounds, since accepted as a general measure, was advocated and practised with excellent results by Captain E. T. C. Milligan, an Australian surgeon, as early as January, 1915.

of infection from the exterior; there may be a potentiality of mechanical derangement of the joint. According to the varying importance of these factors, there is a range of operative treatment from simple extraction of a foreign body to complete resection of the joint or even amputation. The desirability of operating on the second class of case (comminution without remaining projectile) has been debated; but as detached fragments of bone in association with an open wound essentially represent infected foreign bodies, and are more than likely to overtax the natural reactive powers of a joint already fully exercised, their early removal is definitely indicated.

A careful X ray examination is a necessary preliminary to the treatment of these cases; foreign bodies and fractures are recognised and localised. In all articular operations the application of a tourniquet is of great advantage. The skin of the part is thoroughly cleaned. External wounds are excised as before and temporarily sutured or plugged with antiseptic gauze. This done, fresh instruments, &c., are used and the joint opened.

Arthrotomy and "esquillectomy."—Arthrotomy is not at this stage a procedure of drainage. Various methods have been advised, from simple enlargement of the original wound to the routine practice of an extensive incision such as a semilunar arthrotomy in the knee-joint. Although it is essential to make an opening of sufficient size to examine the lesion completely and methodically and to avoid unnecessary bruising of the synovial membrane by manipulation, it is unjustifiable to open up susceptible surfaces to the danger of further infection or to cut through important ligaments unless the position of the foreign body or fracture definitely demands. If preliminary excision has been carefully performed, it is immaterial whether the original wound be included in the incision or not.

The joint is subjected to a mechanical cleansing. Foreign material and fragments of bone are carefully removed. Should the projectile lie in an osseous cavity, extraneous organic material, clothing, &c., are apt to remain in the bed after its withdrawal. Hence the potential source of a focus of osteitis, which is the more likely to spread as fissures so frequently radiate from this centre. The cavity is therefore curetted until the superficial infected spongy tissue, usually infiltrated with blood and of blackish colour, has been completely cleared away and cancellous tissue of normal aspect, bleeding uniformly, has been reached. Incidentally, the scrapings yield a growth of micro-organisms on culture, whilst the cavity after treatment is sterile. During these manipulations the rest of the synovial cavity should if possible be packed off with gauze as in an abdominal operation, to avoid unnecessary infection of the general sac. Synovial membrane which has been bruised by the passage of the projectile is also found to harbour micro-organisms, and should be removed, the gaps being sutured afterwards. The joint is then washed out with saline solution or with an antiseptic such as brilliant green, which is comparatively harmless to the tissues.

Cavities in the bone may be packed with iodoform to induce hæmostasis and as an additional antiseptic measure; but the mechanical cleaning, removal of clothing, blood clot, &c., is of far greater importance than the application of antiseptics.

The synovial membrane is sewn up completely with absorbable material. In certain cases it is possible in sewing up to eliminate an osseous lesion from the general sac and so provide for its drainage outside the joint. If a gap remains in the synovial membrane it may be possible to improvise a covering as before. When the superficial tissues are sewn, it is wise to leave a drain as far as the synovial wound for 48 hours.

Although the establishment of a path to the exterior is dangerous, some surgeons recommend a routine drainage on the joint itself for 24 or 48 hours after operation. This is unnecessary, except in doubtful cases where it may be advisable to establish a temporary arthrostomy as a safety-valve. There may be no alternative when the gap in the synovial membrane is too wide for suture. Needless to say, a joint thus open should be dressed subsequently with a scrupulous regard for asepsis.

Resection.—The French have applied the convenient term "esquillectomy" to the removal of fragments and curetting of cavities of bone. To decide in which cases esquillectomy should be replaced by a typical resection is one of the most difficult questions in the surgery of joint wounds. Many French authorities have been in favour of an extensive application of treatment by primary resection. Leriche considers that esquillectomy is only suitable for small parietal fractures, and that any considerable fracture involving a solution in continuity of the articular surface demands a typical resection of the joint. Undoubtedly it is preferable, in any case which will definitely require resection sooner or later for orthopædic reasons, to resect at this early stage in order that the sources of infection may be removed and orthopædic demands satisfied at the one operation. Indications of this nature vary according to the joints affected and will be referred to later under their individual headings. But, regarded purely as a prophylactic measure to prevent infection, primary resection is proved by the excellent results of esquillectomy to be too radical in the large majority of cases

When it has been decided to resect a joint, however, the operation should generally conform to type as far as possible, with due regard to the removal of a sufficient portion of the extremities of bone and the preservation of capsule, periosteum, and important extra-articular structures. For instance, in a wound involving serious comminution of the femoral condyle without fracture of the tibia it is useless to preserve the articular surface of the latter and so delay the union of the bones.

Amputation.—Amputation as a primary measure is indicated by extensive wounds of the limb, or the combination of a joint wound with an extra-articular lesion of grave importance, such as rupture of the popliteal artery and vein. The presence of wounds in other parts of the body likely to lower the general powers of resistance to articular infection may decide in favour of amputation. During a stress of work, when the continued application of careful after-treatment is a doubtful possibility, amputation may be practically preferable in certain cases. The upper limb should never be amputated unless there is absolute necessity. In the lower extremity an amputation stump is of more functional value than a limb greatly shortened by extension resection.

Primary treatment in doubtful cases.—There are occasions on which the exact line of treatment is not definitely indicated; it is perhaps difficult to decide whether a given lesion demands resection of the joint or whether a more limited procedure will suffice to eliminate infection. In these cases the more conservative measure may be combined with a temporary *arthrostomy*—made *de novo* or adapted. Should the course be unfavourable, this latter will afford a safety outlet, and secondary suture may be applied at an early stage should all go well. The same line may be adopted where primary treatment has for some reason or another been too long delayed. To effect arthrostomy an original wound (preferably an exit wound) may be left unsutured after excision of its edges; a gap may be left in an operative incision; or a special opening may be made. In the case of the knee, Fieux suggests the following technique: a crucial or T incision is made into the upper and outer quadrant of the supra-patellar pouch (frequently this merely implies the modification of the upper end of an arthrotomy wound). The corners of synovial membrane are sutured to the skin with the object of shutting off periarticular tissues as far as possible. The limb is immobilised and raised. On the fourth and fifth day, if infection does not develop in the joint, the synovial edges are released and sutured together; the joint is thus completely closed.

After-treatment.

Constant clinical supervision and—should doubt arise—frequent pathological observations are essential. The onset of septic arthritis or osteomyelitis is always possible and demands further treatment of early application. All cases exhibit a certain degree of pyrexia for the first day or two; this need give no cause for alarm. But a progressive pyrexia and rising pulse-rate, together with a continuation or increase in the local signs of inflammation, will determine a change of attitude, especially when doubt is confirmed by pathological investigation.

For the first few days all cases should be rigidly immobilised. Many French surgeons strongly advocate the use of plaster-of-Paris in the form of "appareils plâtrés à anse." In our hands it has not been generally successful in the early treatment of wounds, and so great an authority as Colonel Robert Jones advises that it should be discarded altogether.

When the object of treatment is mobility, and the asepticity of a case has been provisionally established—i.e., after the temperature has been normal for about a week—light movements are applied. Further treatment in this direction is regulated by absence of reaction and

comparative freedom from pain. When the object is ankylosis immobilisation for a longer period is obviously necessary; due regard should be paid to the position of election. The treatment of these cases by arthroplasty or resection may be considered at a later period. On the other hand, a flail limb may require fixation by securing ankylosis.

Where the progress of a wound is practically aseptic after operation the dressings should not be changed more than is strictly necessary. The exposure of a clean wound is always a risky proceeding under present conditions unless very special precautions are taken.

Post-operative transport should be delayed as long as the military situation allows.

Secondary Treatment.

This applies to the treatment of septic arthritis and osteomyelitis; it is essentially a curative measure designed to deal with established infection, as opposed to primary treatment which is prophylactic in aim. As such, secondary procedures are required in those cases which have been ill-advisedly subjected to expectant treatment and in those where primary operation has failed to eliminate entirely the sources of infection. The available methods are:—

1. Strictly conservative measures, with the object of localising the inflammation.
2. Aspiration, which may be combined with irrigation or the injection of antiseptics.
3. Secondary arthrotomy, esquillectomy, synovectomy, and suture.
4. Drainage by tubes.
5. Arthrostomy, more or less extensive, combined with treatment by Carrel's method, salt packs, &c.
6. Secondary resection.
7. Secondary amputation.

The importance of pathological control in selecting the form of treatment is again emphasised; the issue at stake is now more immediately serious and vital.

It is not my intention to discuss the respective merits and details of those methods, as my experience of wounds at this stage has been limited. Suffice it to say that the functional results are so unhappy as to accentuate the importance of primary treatment.

Amputation, the ultimate measure of defence, should not be too long withheld, especially in the lower limb where its consequences are less serious and the results of delay so frequently disastrous. Provided the general condition is good, however, pyrexia alone does not warrant amputation. The pulse affords a far more definite indication of decreasing resistance which may be further anticipated by pathological observations. *Cæteris paribus*, the longer the duration of the wound the more radical should be the treatment, as the patient is less able to endure the prolonged convalescence demanded by the more conservative methods.

INDIVIDUAL JOINTS.

The Knee-joint.

Adequate primary treatment is of special importance in this joint, of which the complexity renders secondary treatment peculiarly difficult, and thorough drainage, irrigation, or aspiration practically impossible. The diaphragm formed by the ligamentum mucosum and the ligamenta alaria almost separates the joint into two cavities, each of which is again partially subdivided—the one by the cruciate ligaments and their synovial covering, the other by the upper border of the patella where it lies in contact with the femur. Apart from these divisions, there are the various ramifications and cul-de-sacs, such as the popliteus bursa and the post-condyloid synovial pouches.

The anatomical arrangement complicates *diagnosis* in certain cases. The suprapatellar pouch is of varying extent, although it usually extends two inches above the patella; on rare occasions it fails to communicate with the main joint cavity. Hence it may be difficult to decide whether a foreign body or a fracture in the lower part of the thigh directly involves the main synovial sac. Other bursæ vary in the same way as regards their continuity with the joint. The bursa between the patellar ligament and the tubercle of the tibia is almost invariably separate. A missile may traverse the infrapatellar region or even penetrate to a considerable distance without perforating the synovial membrane. Similarly the joint may escape penetration by a fragment which remains lodged in the posterior cruciate ligament.

In these doubtful cases it is wise to assume in the first place that the foreign body or lesion is outside the joint lest the latter should be unnecessarily opened. Careful preliminary excision of the track of the wound is a safeguard against this possible danger.

Pus may escape from the suprapatellar pouch into the fascial planes of the thigh in septic arthritis; it frequently tracks along the popliteus bursa into the calf.

Immobilisation of the knee is effected by a Thomas's knee splint or one of its modifications. Slings made of perforated zinc add stability and greatly facilitate dressing without disturbance of the limb. Local splints may be applied in combination with the Thomas's to afford additional security. A foot-piece obviates rotatory movement and foot-drop. The whole limb is suspended when possible.

As in other joints, *exploratory arthrotomy* is conducted by an incision which affords a minimum degree of mutilation consistent with a free exposure of the intra-articular lesion. Operation by an insufficient incision can only lead to unnecessary traction and bruising of the synovial membrane. The position of the lesion may admit of treatment by excision and enlargement of the original wound. In many cases a simple form of arthrotomy will suffice, e.g., a long vertical incision half an inch from the patella on the inner or the outer side; suprapatellar, lateral or posterior incisions. When a more extensive exposure of the interior of the joint is required, it may be necessary to perform a semilunar arthrotomy or a median arthrotomy by vertical section of the patella. The latter route would seem to afford less risk of exposure to fresh infection and a better functional prognosis than the semilunar method, in which the patellar ligament is transversely divided. Certain surgeons have advocated the routine employment of a semilunar incision in all cases, to provide for complete examination of the joint; but the risk is considerable, and, in the large majority of cases, unnecessary.

Serious comminution of the *patella* is treated by a primary excision of the bone, preferably subperiosteal; the joint is cleaned, and the synovial membrane sutured as far as possible. Minor fractures are treated by esquillectomy, the joint cleaned if penetrated, and the remaining fragments united by suture of the periosteum and ligaments, or by encircling the bone. In many cases the patellar lesion is merely an element of an extensive articular fracture; the whole bone is then removed in the course of a resection of the joint.

Primary resection of the knee is indicated in those cases in which the separated fragments of bone are so extensive as to render the future of the joint functionally hopeless. There is no object to be gained by conservative treatment unless the general condition of the patient is unfavourable for a severe operation. Fractures of this type afford a great potentiality of serious osteomyelitis, and it is therefore advisable to eliminate widely the sources of infection by resection and at the same time to hasten the inevitable ankylosis. Reference has already been made to the question of *amputation* of the lower limb. In both these forms of operation measures should be taken to combat shock by nerve-blocking and by saline infusion, &c.

Much has been written about the *secondary treatment* of knee wounds. Some surgeons claim good results from simple drainage. Chutro has successfully applied Carrel's method. Others open the joint widely, turn back the patella, remove the semilunar cartilages, and divide the lateral and cruciate ligaments; a position of flexion is maintained until infection is subdued, and the joint is resected or merely extended at a later period. Chaput advocates drainage by patellectomy. Fullerton has had good results from resection with wide separation of the bones. Ballance advises resection with removal of the sharp posterior margin of the sawn condyles, in order that drainage of the intercondylar and post-condyloid pouches may be established. Yet another school resorts to early secondary amputation where more conservative measures, such as aspiration or simple arthrostomy, fail to establish drainage.

Other Joints.

The Elbow.—In the elbow it is practically impossible for the synovial membrane to be wounded without associated injury of bone. Wounds of this joint are less dangerous, however, than articular fractures of the knee; in the event of septic arthritis, it is possible effectively to establish drainage as a rule, and amputation—a catastrophe in the upper limb—is rarely necessary. At the same time, the local result is frequently unsatisfactory, and ankylosis or flail limb is only too common. Of the two, ankylosis in a good

position is the more profitable. *It is therefore advisable to err on the conservative side in removing bone.* When a typical resection is definitely indicated, every attempt should be made to preserve the periosteum and capsule as far as possible. Arthrotomy, whether primary—to be followed by suture—or secondary, for purposes of drainage, may be effected by excision and enlargement of the original wound; by incisions on either side of the olecranon, preferably the outer; by division of the external lateral ligament; or by subperiosteal removal of the olecranon process.

Fixation in a flexed position is generally desirable. Early movement should be applied where the evolution is aseptic. Inevitable ankylosis is met by securing the joint at an angle of 100° or otherwise as the patient's occupation indicates.

The Shoulder.—Complete resection of the shoulder is also followed frequently by very considerable limitation of movement, especially when the function of the deltoid has been impaired by inflammation or by loss of tissue. Ankylosis is again preferable to a flail limb, and economical removal of bone fragments is better on the whole than typical resection unless the latter is definitely indicated by serious comminution in the early stages or urgent need for radical drainage later. Drainage operations should take into account the subscapular, bicipital, and infraspinate synovial protrusions. Posterior, and especially external, incisions endanger the circumflex nerve, although the former are frequently necessary. Occasionally a foreign body lodged in the head of the humerus may be removed through an osseous channel without opening the joint. A form of triangular humerus splint may be applied to the treatment of shoulder wounds. The position of election for ankylosis is abduction (50°), with slight flexion and internal rotation of the arm.

The Wrist.—The tendency of the carpal bones to necrose and the complexity of the synovial cavity and tendon sheaths in the neighbourhood of the wrist render the treatment of established infection difficult as in the knee-joint. Although the results are less dangerous, the restoration of function is at least as important economically in the former. *Primary treatment is strongly indicated*, in spite of a natural tendency to neglect wounds of less vital importance during the early stages of evacuation. Unless the wound is comparatively innocuous and likely to respond to conservative treatment, a long dorsal incision is made between the tendon of the extensor longus pollicis and that of the extensor indicis, or on the inner side of the joints if more convenient. Osseous fragments are removed and fractured carpal bones enucleated. Complete resection may be required for satisfactory drainage at a later stage. Retention in a position of dorsiflexion is indicated in view of the possibility of ankylosis, but in favourable cases early movement should be practised.

The Hip.—Wounds of the hip-joint are frequently accompanied by lesions of more immediately vital importance, such as abdominal or seriously infected buttock wounds. On account of the comparative anatomical simplicity of the joint itself the ultimate establishment of satisfactory drainage, whether by arthrostomy or resection, is fairly certain. It is therefore advisable to withhold resection during the early stages of evacuation, as the operation is severe and the necessary post-operative fixation cannot be adequately applied during transport. Excision of the wound, posterior drainage or Carrel's treatment, represent the primary measures. Disarticulation is exceptional. Jones's abduction frame provides a satisfactory form of splint. A position of extension with slight abduction and outward rotation of the thigh is assumed in case of impending ankylosis.

The Ankle.—Astragalectomy is said to have afforded good results in wounds of the ankle that fail to respond to the more conservative measures. In severe wounds amputation should not be withheld; it guarantees a safe result and inflicts a comparatively inconsiderable disability in return.

In general, wounds of joints are classed with the more dreadful injuries of war; but in no other branch of military surgery may so great an individual and national benefit be derived from thoughtful treatment.

I am greatly indebted to Captain Lazarus-Barlow and Captain Adrian Stokes for pathological suggestions, to Captain S. Littlewood for notes on late treatment, and to Sergeant Shirley, R.A.M.C., for expert advice in radiography; also to the authors, chiefly French, of recent publications referring to this subject.

OBSERVATIONS ON

DIRECT TRANSFUSION OF BLOOD, WITH A DESCRIPTION OF A SIMPLE METHOD.

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TREATMENT by direct transfusion of blood has attracted much attention of late during the course of the war, since benefit has been obtained by it in many cases of hæmorrhage and in certain cases of anæmia secondary to sepsis. Lives have been saved when all other methods of resuscitation have failed. In many cases the effect has been immediate and dramatic. We have seen patients who were blanched and shocked and with a pulse hardly perceptible brought back to life in a most astonishing way, and we believe that the method ought to be used much more widely than is the case at present. At the same time, we do not recommend its indiscriminate use, and we ourselves have only resorted to it in cases which we considered desperate.

Indications.

After a rapid and moderately severe hæmorrhage, the main indication is to administer fluid (to restore the normal blood volume), and this can quite readily be accomplished by the introduction of saline solution into the circulation. If, however, the hæmorrhage has been very severe, if it has been recurrent, or if it has taken place in a patient already anæmic as the result of prolonged sepsis, the hæmoglobin content of the blood may be reduced to a level below that sufficient to maintain life. Under these circumstances saline fails to produce the desired effect, inasmuch as it cannot supply other essential elements of the blood, such as hæmoglobin.

As the result of our present experience, we believe that when the hæmoglobin falls to 20 per cent. or lower, transfusion is imperatively indicated, as the anæmia due to a percentage so low as this is sufficient of itself to cause death. If the percentage remains between 20 and 30 for any length of time, the anæmia is still dangerous, and transfusion of blood ought to be performed. With a percentage between 30 and 40 the indications are less clear, but there can be no doubt that an anæmia of this intensity lowers the patient's resistance to infection. In a patient, therefore, with this degree of anæmia accompanied by severely septic wounds we are of opinion that blood transfusion may often be resorted to with advantage.

Blood with a percentage of hæmoglobin of 40 appears to be sufficient to carry on full oxidation in a patient at rest in the recumbent position. It must be remembered, however, that transfusion accomplishes something more than the introduction of red corpuscles into the circulation. The introduction of fresh leucocytes and the ordinary protective substances of the blood plasma may be, apart from the supply of hæmoglobin, of service in certain septic cases. Reports from surgeons[1] in the war area show that improvement in the condition of septic wounds has taken place as the result of transfusion, and our experience in several cases bears this out. For this reason we think that even when the percentage of hæmoglobin is 40 or over improvement in the condition of patients who are septic and anæmic may still be expected from transfusion.

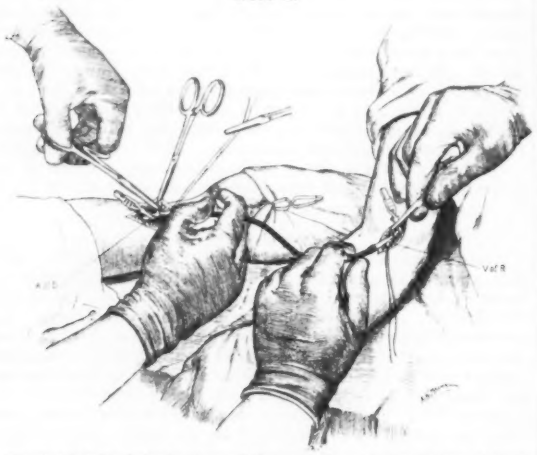
When the anæmia is secondary to sepsis, it may be regarded as an indication of a process of deterioration taking place in the blood. If benefit is derived from transfusion under these circumstances it is reasonable to suppose that this is due to the protective substances of the transfused blood rather than to the hæmoglobin. This contention was supported by a few observations on the bacteriolytic power of the blood of several of our patients after transfusion, which were kindly carried out by the late Captain Tanner. The hæmoglobin given to the patient can be readily demonstrated and accurately measured, but the other elements of the blood are less easily controlled or investigated, and little is known of their persistence under the abnormal physical conditions obtaining as a result of the various methods of transfusion that have been employed. For this reason we consider it important to carry out transfusion under conditions as physiological as can be obtained, so that destruction of leucocytes or protective substances may, so far as is possible, be avoided.

Selection of Donors.

No difficulty has been experienced in finding donors without causing wastage to the Army. Men who are unfit to return to their units for some weeks on account of some slight injury (such, for instance, as a sprained ankle) are generally quite willing to give blood to a wounded comrade.

The donor should, of course, be carefully examined and interrogated so as to exclude the possibility of using men suffering from such diseases as tubercle or syphilis. We have not considered it necessary to examine the compatibility of donor and receiver from the point of view of agglutination and hæmolysis, as the conclusions to be drawn from these tests are by no means definite. In addition, septic cases often show auto-agglutination, thus rendering the tests unreliable. The dangers of transfusion (hæmolysis, agglutination of corpuscles, or symptoms similar to those of

FIG. 1.



Illustrating the introduction of the cannulæ. A of D, Artery of donor. V of R, Vein of receiver.

anaphylaxis) can to some extent be avoided by carefully observing the effect of transfusion in the recipient during the operation. American writers[2] with wide experience do not consider that the risks of a fatal result from transfusion exceed 1 or 2 per cent., even if donors not related to the recipient are used and blood tests are not previously employed. Under the conditions obtaining in warfare we consider it justifiable to take risks so relatively small.

Description of Method.

Transfusion is effected from a small artery to a suitable vein. The apparatus used consists of two glass or silver cannulæ connected by a short length (about 7 inches) of indiarubber tubing, the whole being coated within and without by a thin layer of wax made by mixing hard and soft paraffin. Paraffin has been widely used for the prevention of clotting for a long time, but Saxton Pope[3] has recently described a method of using rubber tubing coated with a mixture for direct transfusion in man. The technique here described is an elaboration of a method based on his, our own, and others' experience.

We use thin-walled, transparent, indiarubber tubing which will stand heat and which will allow pulsations to be easily felt during the operation. The paraffin mixture consists of about equal parts of the constituents, or these should be mixed in such proportions as to set at a temperature between 43° and 48° C., the optimum being about 45°. This mixture may be used again and again, but should be strained occasionally to ensure its freedom from solid particles. The rubber tubing can be used several times, if necessary, but it is preferable to renew it for each operation. Before coating the cannulæ and tubes should, of course, be absolutely clean and dry.

Coating is effected by immersing the apparatus in the paraffin mixture in a bath, the temperature of the mixture being kept at about 130° C. Sterilisation of the cannulæ and tubes is thus effected. The connected cannulæ and tubes are allowed to fill with the mixture, care being taken to avoid air-bubbles. The apparatus is then held vertically by seizing the smaller cannula, and the fluid is allowed to run out of the end of the larger. The last drops are removed by drawing the end of the dependent cannula lightly across sterile gauze. The coating is allowed to set, and the tubes are then wrapped in sterile material, ready for use. They may, if desired, be placed in a sterile test-tube of the requisite length, which is then carefully plugged. If the tubes and cannulæ are coated in this way no clotting need be anticipated, as in experiments on animals no clotting has been found after 2½ hours.[4] Should clotting take place it will be found to be due to excessive injury to the vessels, especially the artery, or to damage to the coating of the tubes from rough handling. The small orifices of the cannulæ are then quickly blocked and the flow ceases. All that is necessary in this event is to replace the apparatus with another which should always be at hand.

The cannulæ we have found most useful are those shown in Fig. 1. They are silver[5] with a bulbous end so as to ensure their retention in the vessels without the necessity of tying or holding them in. Glass cannulæ of similar size and shape may be used. The ends of these are bevelled by grinding on stone or brick to facilitate introduction. They have the advantage of being easily improvised in any ordinary clinical laboratory, but it is difficult to make a bulb of suitable size to fit tightly into the vessels, and they therefore require to be retained by ligature or by holding them in—a most tiresome process. The dimensions of the cannulæ are as follows:—Arterial cannula: Length, 4 cm.; external diameter at point, 2 mm. Venous cannula: Length, 4 cm.; external diameter at point, 3 mm.

Operation

A glance at the diagrams (Figs. 1, 2A and 2B) will give a good idea of the steps of the operation.

The patient and the donor are placed side by side on beds or tables at a suitable distance apart, so that there may be no tension on the tubes. A small table, or a board of suitable size, may be placed between the beds or tables so as to allow the limbs to be placed in position. The limbs

FIG. 2A.

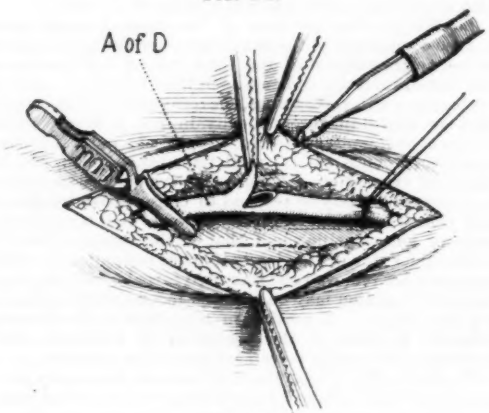
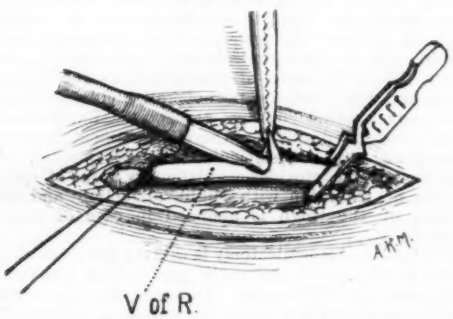


FIG. 2B.



Illustrating on a large scale the introduction of the cannulæ.

should be placed parallel and as close together as convenient. We have found the radial artery of the donor the most suitable to use, and in the recipient one of the veins at the bend of the elbow or the internal saphenous of the leg.

Local anæsthesia is used and the radial artery of the donor and the selected vein of the recipient are dissected out. The instruments for each ought to be kept separate and the operators, two of whom are necessary, ought to keep each to his own vessel to minimise the risk of infection being carried from recipient to donor. The artery must be

carefully dissected and all unnecessary trauma avoided. Rough handling may cause spasmodic contraction of the vessel and difficulty in introducing the cannula. In addition, unnecessary damage may produce clotting. When both vessels are exposed they are ligated at their distal ends and a *light* bull-dog forceps is placed on the proximal end of each. A V-shaped incision is then made with sharp scissors into each vessel. The scissors must be sharp right up to the points, as otherwise the vessel is liable to be crushed instead of cut. If the incision is made close to the ligature, tension on the latter tends to make the opening gape, and facilitates the introduction of the cannula. If the flap made by the incision in the vessel is seized at the extremity with a fine forceps, the introduction of the cannula is still further facilitated. The arterial cannula (the smaller) is then introduced and the bull-dog forceps released for a moment to allow the apparatus to fill with blood and expel air. The forceps is then replaced and the venous cannula introduced. Both bull-dog forceps are then removed and the blood allowed to flow.

Care must be taken to avoid kinking of vessels or tube. Arterial pulsations can be felt through the thin rubber tube and in the receiving vein. Under suitable conditions, the rubber tube will vibrate with each pulsation. If for any reason it is desired to arrest the flow of blood temporarily, this should be done by reapplying the bull-dog forceps to the artery and not by compressing the rubber tube, as this is liable to damage the paraffin coating. At the end of the operation the vessels are tied proximate to the injured part and cut between the ligatures. The stitches for closing the wounds may with advantage be passed before the effect of the local anæsthetic has passed off. They then only require to be tied at the end of the operation.

If a patient is suffering from anæmia as a result of a secondary hæmorrhage and requires amputation (e.g., through the thigh) it is usually better to transfuse him before amputation rather than after. If the transfusion is performed after the patient has gone back to bed or when the operation is completed and the dressings applied vessels which were invisible at the time of the operation may begin to bleed when the blood pressure rises. On the other hand, if the transfusion precedes the amputation, the rise in blood pressure will ensure that any vessel likely to bleed will do so while the patient is on the operating table. In this way every bleeding point can readily be detected and dealt with.

Determination of Amount of Blood to be Given.

The amount given should be regulated by the condition of the donor and that of the recipient.

The onset of anæmic symptoms in the donor indicates that he has lost as much blood as he can conveniently afford. In a man of average weight these symptoms will arise when he has lost about 1000 c.c. (1¾ pints), if the loss has been at the usual rate. The onset of the symptoms is dependent on the loss of from 20 to 25 per cent. of his total blood volume.*

In practice 600 to 1000 c.c. will be found a liberal allowance, and we have only once exceeded this amount. Robertson[6] recommends a similar amount. During the course of the transfusion the donor complains of nothing abnormal until from 10 to 25 minutes have elapsed, according to the rate of flow. The onset of symptoms (faintness, thirst, and pallor) is rather abrupt, and should be taken as an indication for stopping transfusion. These symptoms may be intensified immediately after transfusion has stopped, but they soon subside and never give rise to anxiety. The donor's head should be kept slightly raised during the operation in order to observe more easily the first sign of faintness. If the loss of blood has been slower than usual the symptoms of anæmia will arise at a correspondingly later period. If the donor shows no sign of anæmia the inference is that no blood or an insufficient amount has passed. This may be due to thrombosis or obliteration in the receiving vein (as happened in one of our cases). If there is no block in the apparatus a fresh vein should be selected and the operation continued until some sign is visible in the donor.

The symptoms in the recipient that call for cessation of transfusion are rigors, præcordial pain, increase in the pulse-rate, and failure to improve in colour though blood is ascertained to be flowing into his vein. These symptoms have only been observed in two of our cases (Cases 9 and 13). We have never noticed injurious distension of the heart from the increased volume of fluid in any one of our patients. On the other hand, we have seen a venous engorgement of commencing heart failure, which was present before the operation, actually disappear during the process of transfusion, and this we attribute to the beneficial effects of the supply of fresh hæmoglobin.

* This has been ascertained by investigations, as yet unpublished, made on blood volume by one of us (G. D.).

After-history of donors.—We have kept the donors under observation in all cases until we were satisfied that all danger of untoward result was past. Nothing more than the most temporary disability has resulted in any case. The donor is kept in bed for a day or two and is then allowed to get about (if the condition for which he was admitted to hospital warrants it). At the end of a week he is fit, so far as the effect of the loss of blood is concerned, for light work. At the end of three weeks he is fit for full duty. In the cases in which we have investigated the blood, we have found that the hæmoglobin percentage begins to rise rapidly about the fourth day. This rapid rise continues for some days and is then followed by a more gradual rise until at the end of about three or four weeks the percentage is practically normal.

Benefit of Transfusion.

The main advantages of the method we have just described are its simplicity and the fact that the instruments required for the operation can be packed into small bulk so as to be capable of being carried in the pocket. The apparatus can, if necessary, be improvised from material to be found in any clinical laboratory. In addition, the transfusion is conducted under conditions as near the physiological ideal as possible. The main disadvantage is that the amount of blood given cannot be accurately ascertained at the time, as can be accomplished by the use of Kimpton's tubes, syringes, &c. We have, however, tried to show that this disadvantage is not of much importance, if attention be paid to the condition of the donor and that of the recipient.

Our main object is to insist on the value of transfusion of blood, and we consider it of relatively little importance by which method it is carried out. Transfusion of blood is a procedure, simple, comparatively safe, and of extreme value in certain cases. If the results about to be mentioned do not look very striking on paper it will be seen that this is due to the fact that only desperate cases have been chosen for this form of treatment, and that we have not considered statistics in our endeavour to give the method a trial even in the most hopeless cases.

The benefits of blood transfusion will vary with the class of case. In a patient suffering from anæmia due to hæmorrhage alone, sepsis being trifling or absent, the effects are likely to be immediate, striking, and permanent. Most cases of primary hæmorrhage fall into this class.

In a patient suffering from a combination of sepsis and anæmia, if the latter is the chief factor, immediate improvement will be apparent in his mental and general condition. Most cases of secondary hæmorrhage belong to this class. The permanency of the improvement will largely depend on whether a further hæmorrhage can be prevented and sepsis controlled.

In a patient suffering from sepsis and anæmia, if the sepsis is the chief feature, and the anæmia secondary to it, little immediate change may be noted. Nevertheless, in a few days very obvious improvement may occur, apparently as the result of the transfusion. The permanency of the improvement here will depend on the ability of the surgeon to combat the sepsis. The transfusion has given him, at any rate, temporary assistance.

Short Summary of Cases.

CASE 1.—Private S., under the care of one of us (H.C.B.). Wounded July 4th, 1916, with high-explosive shell. There was a wound of the buttock involving the bladder. A large piece of shell was firmly embedded in the sacrum. On July 13th an unsuccessful attempt was made to remove the foreign body. On July 14th considerable bleeding from the deep wound took place. Bleeding points inaccessible. July 17th, transfusion of blood. The patient at this time was extremely ill and almost died as the result of being moved to the theatre. Transfusion produced considerable and rapid improvement. Consciousness, which had been almost lost, returned. Respiration and pulse improved, and venous engorgement due to failing heart disappeared. A few hours later, however, bleeding recurred and the patient died.

The hæmoglobin percentage was 33·7 before transfusion and 39·4 immediately after. The patient had recived 400 c.c. of blood as ascertained by subsequent calculations from the hæmoglobin percentages of donor's and recipient's blood, taken before and after transfusion.

CASE 2.—Private W., under the care of Captain Wilkins. Wounded by high-explosive shell on July 3rd, 1916. Head and shaft of humerus on left side shattered. Gas infection. Head of humerus excised on July 5th. Secondary hæmorrhage on July 16th and again (very severe) on July 17th. The axillary artery was found divided and the ends were ligatured. Patient remained very anæmic and was depressed, irritable, and restless. Transfused for 14 minutes on July 21st. Immediate improvement in his colour and in his mental and physical condition took place during transfusion. His wounds rapidly cleaned up and his temperature settled. This improvement steadily progressed and the patient was evacuated to England, some weeks after, looking the picture of health.

The hæmoglobin percentage was 25·3 before the transfusion, 36·2 immediately after, and 42·2 24 hours later. It was estimated that he had received 660 c.c. of blood.

CASE 3.—Private Y., under the care of Major West. Wounded by high-explosive shell on July 6th, 1916. He had his right leg amputated at a casualty clearing station on July 7th. On July 17th he had secondary hæmorrhage from extensive wounds of the left leg. Amputation of the left leg was performed on July 21st. Patient was sent to the base with both legs amputated through the knee-joints. His flaps were septic, he was anæmic, his pulse was 150, and his temperature ranged from 101° to 102° F. As his condition was becoming worse he was transfused on July 29th. There was only slight improvement noticed in his colour during the operation. On the 31st, however, the improvement in his condition was very obvious. His wounds almost immediately began to clean up and were granulating well on his discharge to England on August 17th. His spirits had greatly improved and he had gained flesh.

The hæmoglobin percentage was 22 before transfusion and 38·2 immediately after. It was estimated that he had received 750 c.c. of blood.

CASE 4.—Private R., under the care of Captain Hardy. Acute lymphatic leukæmia. The patient reported sick on July 19th, 1916, with toothache and sore gums, following malaise which had lasted six weeks. Sent to base on July 23rd. Extensive gingivitis and necrosis of upper jaw were found. Leucocytic count of 25,000 (mainly large mononuclears). This had risen to 141,000 on August 7th. The ulcerated surfaces in his mouth were scraped, and this was followed by a fair amount of hæmorrhage. Wassermann reaction negative. The local and general condition became rapidly worse. Transfusion was carried out on August 8th, 1916. The patient's colour improved and his mental condition became brighter. The improvement, however, was only transitory, and he became progressively weaker and more anæmic at much the same rate as before, merely starting afresh from a higher level on his downhill course. He died on August 14th.

The hæmoglobin percentage was 17·3 before transfusion and 28·9 immediately after. It was estimated that he had received 500 c.c. of blood.

CASE 5.—Rifleman M., under the care of Major May. Wounded by high-explosive shell on July 23rd, 1916. His left leg had been amputated at a casualty clearing station. His right knee-joint was infected, and he had multiple wounds of his right leg, thigh, and buttock, also of his right arm and forearm and left arm. The wounds showed no tendency to heal. The patient was anæmic, querulous, and in poor condition when admitted to a base hospital on July 29th. He was transfused on August 9th. Immediate improvement in his colour was apparent, and later his general condition also improved. Amputation was performed for septic arthritis of the knee-joint. He had a large abscess extending from the popliteal space to the buttock on the right side. The improvement in his condition was not maintained, as sepsis continued in spite of all efforts to control it. He died on August 23rd.

The percentage of hæmoglobin before transfusion was 36·3, immediately after 50·9 and 57·2 24 hours later. It was estimated that he had received 750 c.c. of blood.

CASE 6.—Corporal E., under the care of Major West. He came down to the base with a fragment of high-explosive shell lodged in the body of his fifth lumbar vertebra; this was removed on August 21st, 1916. Secondary hæmorrhage took place from the deep cavity on August 31st. Transfusion was carried out on Sept. 3rd. Very little improvement took place, and his temperature, which had ranged between 103° and 104° F., continued high. Death from sepsis took place on Sept. 7th.

The hæmoglobin percentage was 24·2 before transfusion, 30·4 immediately after, and 32·7 24 hours later. It was estimated that he had received 530 c.c. of blood.

CASE 7.—Under the care of Lieutenant Matson. Admitted to a base hospital on July 23rd, 1916, with shell wounds of head and shoulder. Gas infection was present. The shattered head of the humerus was removed on August 1st, 1916. On August 12th blood culture showed 30 colonies of streptococci per c.c. of blood. His evening temperature ranged from 103° to 105° F., and his pulse was weak and rapid. On August 17th he became semi-conscious and began to go down hill steadily. He was transfused on Sept. 3rd. There was slight temporary improvement, but this was not maintained, and he died from septicæmia 24 hours later.

The amount of blood which this patient had received was not determined.

CASE 8.—Private C., under the care of Captain Lock. He was wounded by a bullet in the right shoulder on August 18th, 1916. Secondary hæmorrhage took place on August 31st. The axillary artery was found to be wounded and was ligatured. The patient was now very weak and anæmic. The temperature rose to 103° F., and his pulse-rate ranged from 100 to 128. His shoulder-joint was found to be infected. Gangrene began to appear in the arm on Sept. 3rd. He was transfused the same day, preparatory to proposed amputation at the shoulder-joint. Definite improvement took place, and the operation was carried out on the 4th. His condition remained fairly good till the 5th, when he suddenly began to fail, and death took place on Sept. 6th from sepsis.

The hæmoglobin percentage was 52·2 before transfusion, 57 immediately after, and 58·2 24 hours later. It was estimated that he had received 300 c.c. of blood.

CASE 9.—Lieutenant S., under the care of Major Webb Johnson. He was admitted to a base hospital with a septic wound of his left knee-joint. On August 16th amputation through the lower third of the thigh was carried out for secondary hæmorrhage. On August 18th he had double parotitis. His temperature remained high and swinging and his pulse-rate was usually 120 or over. On August 21st he was much worse and looked thoroughly septic. His temperature had been ranging from 100° to 103° F., and his pulse-rate from 120 to 150. He was transfused at 2 P.M. on the 21st. His pulse-rate before the operation was 136. During transfusion he had rigors and profuse sweating and his pulse-rate increased to 150. The weak, rapid pulse and the rigors lasted for an hour or more after transfusion. At 5 P.M. his condition was good and he felt comfortable. The parotitis, which had been diminishing previous to the transfusion, had completely disappeared by the next day. The high swinging temperature continued, however, and he had much pocketing of pus in the amputation stump. After a very tedious convalescence the patient was transferred to England on Nov. 3rd, 1916, well on the way to recovery.

As a result of further experience we consider that this patient had a definite "serum reaction," and it would have been wiser to have stopped the transfusion on the first onset of symptoms. It is open to doubt that his recovery was in any way due to transfusion. The percentage of hæmoglobin before transfusion was 41·3, and 43·5 immediately after. The amount of blood which he had received was not determined.

CASE 10.—Lieutenant W., under the care of Major Martin. The patient was wounded in the right thigh on August 18th, 1916. Secondary hæmorrhage took place on August 28th. Transfusion was attempted the same day, the vein chosen being the internal saphenous in the leg. Though the rubber tube pulsated, the donor felt no ill-effects, and the patient did not improve. It was subsequently found that the receiving vein was impervious a little higher up, above the seat of operation. The patient died a few hours later.

The patient received *no* appreciable amount of blood. Such a failure should be avoided in future by attention to the condition of the donor, as has been explained in the text. Hæmoglobin percentage before transfusion was 48·7 and 49 immediately after.

CASE 11.—Private E., under the care of Lieutenant A. T. Edwards. He was wounded on July 20th, 1916. On admission to a base hospital he was found to be suffering from a compound fracture of the femur and was in a very septic condition. On Sept. 1st a large amount of pus was evacuated from an abscess in the gluteal region. His condition remained unsatisfactory and amputation was decided on. On Sept. 7th transfusion was carried out preparatory to amputation. The flow was allowed to continue for 12½ minutes. There was an immediate improvement in the colour and condition of the patient. He had, however, a rigor after his return to the ward. On Sept. 8th amputation through the upper third of the thigh was carried out under stovaine spinal anæsthesia. The shock after the operation was very severe, but improvement soon set in and patient was transferred to England in good general condition on Sept. 24th.

The hæmoglobin percentage was 21·3 before transfusion, 36·0 immediately after, and 43·5 24 hours later. It was estimated that he had received 1000 c.c. of blood.

CASE 12.—Private E., under the care of Captain Driberg. Patient was wounded by a bomb on August 29th, 1916. The upper end of the left tibia was injured, the knee-joint was opened, and he had gas gangrene of his left thigh. He had also a penetrating wound of his chest. Attempts were made to save the leg, but amputation was finally decided upon. Preparatory to this transfusion was carried out to fit the patient for the ordeal. The improvement was very obvious, and amputation was successfully accomplished next day. Unfortunately, the patient had a severe hæmoptysis from an abscess cavity in the left lung on Sept. 19th, and died on Sept. 21st.

The hæmoglobin percentage was 33·0 before transfusion, 43·3 immediately after, and 44·3 24 hours later. It was estimated that he had received 400 c.c. of blood.

CASE 13.—Private C., under the care of Mr. John Campbell. The patient was wounded on Sept. 1st, 1916. He had a compound fracture of the upper end of the humerus, and his wound was very septic. The temperature ranged from 101° to 104° F. He had moderate secondary hæmorrhage on the 15th and a more severe attack on the 19th, after which the limb was amputated through the shoulder-joint. His temperature remained high after the amputation, and his anæmia showed no sign of improvement. He appeared to be going down hill gradually. Transfusion was carried out on Sept. 26th. The patient was a Canadian and the donor a healthy Scotchman. For the first two minutes of the flow the patient improved. He then complained of feeling cold and actually shivered. Later, he complained of præcordial oppression, his pulse began to fail, and he became more pallid than he was before transfusion. The operation was abandoned, but the pulse continued to fail, until it finally became imperceptible about 20 minutes from the commencement of transfusion. Respiration continued for a few minutes longer and then ceased. Death occurred about 30 minutes after the commencement of the transfusion. Artificial respiration and the injection of pituitrin failed to produce any improvement. A post-mortem examination was made a few hours later. No sign of clotting could be discovered in the recipient vein, the pulmonary vessels, or the coronary arteries. There was no indication anywhere of embolism or thrombosis. It seems possible that this patient died as the result of "serum reaction."

The amount of blood received was not determined.

CASE 14.—Under the care of Captain Wagstaffe. The patient had suffered for some months from sepsis as the result of a head injury (with cerebral abscess), a compound fracture of the right femur, wounds of the right leg and foot involving the ankle-joint, and wounds of both arms. He had become extremely anæmic, and for several days previous to transfusion he had been in a collapsed condition with no febrile reaction. Amputation of the right leg was performed under local anæsthesia and morphia, and he was then transfused. The symptoms of shock continued in spite of transfusion, which failed to produce any obvious improvement. The patient was outside our area and further details are not available. He died a few days later.

The hæmoglobin percentage before transfusion was 20·9 and 41·7 immediately after. It was estimated that he had received 750 c.c. of blood.

CASE 15.—Private H., under the care of Lieutenant A. T. Edwards. He was wounded on Sept. 29th, 1916. There was a compound comminuted fracture of the tibia, the wound being very foul. On Oct. 6th he had severe secondary hæmorrhage, the loss of blood being estimated at about a pint, before control was effected. Amputation was decided on. On Oct. 7th preliminary anæsthesia was effected by an intrathecal injection of stovaine and glucose. A few seconds later collapse occurred, the patient becoming unconscious, with shallow breathing, dilated pupils, and imperceptible pulse. Artificial respiration was carried on for 15 minutes, when the pulse again became perceptible at the wrist. Amputation was then performed, the patient being still unconscious. He was then transfused. In about six minutes his colour improved and he recovered consciousness. The transfusion was continued for 15 minutes, and the patient went back to bed with a good radial pulse of 88. He continued for some time to have fever, but his condition gradually improved and he was transferred to England, doing well, on Oct. 27th.

The amount of blood received was not determined.

CASE 16.—Rifleman A., under the care of Captain Whittington. He was wounded on July 10th, 1916, by high-explosive shell, a fragment of which lodged in his knee-joint. Attempts were made to save his

joint, but this became septic, and the onset of septicæmic symptoms necessitated amputation through the middle of the thigh. This was carried out on Sept. 24th. There was considerable shock from the operation. His temperature gradually fell until the 29th, when it rose again, and pain was complained of in the left hip. His pulse, which had from the first been rapid, did not improve. On Oct. 10th a large pyæmic abcess was opened in the region of the left hip. The pus contained *Staphylococcus aureus* and a short-chained streptococcus. Immediately after the opening of the abscess, transfusion was carried out, a brother (weighing 10 st.) being used as the donor. The flow was continued for 30 minutes, until the donor suddenly showed very obvious anæmic signs. He had felt symptoms coming on earlier, but in his endeavour to help his brother had not complained. The patient's colour and condition were much improved. This improvement continued for a week or so, but his temperature and pulse began again to rise, and he died from sepsis on Oct. 25th.

The hæmoglobin percentage before transfusion was 45·3, and 67·4 two hours after. It was estimated that the patient had received 1030 c.c. of blood.

Summary of Results.

On analysis of the 16 foregoing cases we find that 1 (Case 10) received no blood owing to an undetected obliteration of the receiving vein. In 3 (Cases 4, 7, and 14) the patients appeared beyond hope of recovery and transfusion was only undertaken as a last resort. Of the other 12 in which improvement might have been anticipated, 4 (Cases 2, 3, 11, and 15) made very rapid and satisfactory progress, which we could have no hesitation in attributing to the transfusion. These cases have recovered or are well on the way to recovery. In Case 9 recovery cannot be attributed to transfusion; he suffered from symptoms during the course of the flow suggestive of a "serum reaction."

The remaining 7 cases are dead, though hopes of their recovery were entertained. Of these cases 4 (Cases 1, 5, 12, and 16) showed decided improvement as the result of transfusion, but this, unfortunately, was not maintained. In 2 others (Cases 6 and 8) slight improvement took place, and in 1 (Case 13) death was probably accelerated by the transfusion. The fact that improvement took place even in most of the cases that died encourages us in the belief that under similar circumstances in future transfusion might just tide the patient over a critical period and allow time and opportunity for further surgical treatment.

As has already been mentioned, a "serum reaction" took place in 2 cases. No serious ill-effects followed in Case 9, but in Case 13 (in which death was probably certain in any case) the final event was hastened.

In addition to the cases mentioned above, there must now be a considerable number in which the method used by us has been tried by officers in our own and other areas. We have given the details only of those for which we are responsible. During the time one of us (A. F.) was doing temporary duty with one of the armies the opportunity was taken of discussing the method with officers of casualty clearing stations in that army. We append a letter from Captain John Fraser, working at one of these clearing stations, and also a communication from Lieutenant A. T. Edwards, working at a base hospital, which we think will help to encourage those who are interested in this subject.

Captain Fraser writes as follows:—

We have had two interesting and successful cases of blood transfusion done with your apparatus. Two officers were wounded by the same shell, both of them in the centre of the upper part of the thigh. Both of them arrived at the casualty clearing station profoundly blanched. One appeared to be dying—no pulse could be detected, and he was scarcely conscious. This case (Case A) was put under light anæsthesia and was found to have complete division of the superficial femoral artery and complete division of the deep femoral artery and vein. The superficial artery was sutured and the channel re-established. The completely divided vessels were ligatured. I transfused blood from the donor—a big Irishman—for 15 minutes, using liquid paraffin (B.P.) as a lubricant. During the whole procedure we had not the slightest hitch, and on removing the tubes at the end of the proceeding no clot was apparent. This officer is making an uninterrupted recovery.

The second officer (Case B) had complete division of the deep femoral artery and vein. No donor was forthcoming and I transfused him with two pints of normal saline. At the end of 18 hours his condition was much worse. The pulse had risen to 160 and his wounds were badly infected. A donor was now obtained and we transfused blood for 22½ minutes. Fifteen minutes after the commencement of the operation the stream was obviously becoming sluggish and I accordingly changed the tubes. Otherwise there was no hitch. Again I used liquid paraffin as a lubricant. This morning officer B has a pulse-rate of 106 and in every way is making an excellent recovery.

Lieutenant Edwards has forwarded notes of a case of secondary hæmorrhage from the kidney which he successfully treated by transfusion of blood, using the method described in this paper.

The patient was wounded in the left kidney by a piece of high-explosive shell on Nov. 25th, 1916. He had severe secondary hæmorrhage on Dec. 24th and was blanched. The affected kidney was removed, and transfusion was performed immediately after. The improvement in the patient's condition was dramatic, and he is now making a satisfactory recovery.

References.

1. Robertson: Brit. Med. Jour., 1916, ii., 38. Archibald: THE LANCET, 1916, ii., 429. Journal of R.A.M.C., November, 1916, xxvii., 636. Primrose and Rutherford: Brit. Med. Jour., 1916, ii., 384.

2. That American authors are not quoted is due to the difficulty of access at present to their extensive literature and not to any lack of appreciation of their work. A full list of the less recent literature on this subject is given by Ingebrigsten, Nordiskt Med. Arkiv., Ab. 1, 1915.

3. Saxton Pope: Journal of Amer. Med. Assoc., 1913, lv., 1284.

4. Experiments not yet published carried out by one of us (H. C. B.) in conjunction with W. C. Quinby, of Boston, U.S.A.

5. All the instruments described may be obtained from Messrs. Down Bros., St. Thomas's-street, London, S.E. They have also been supplied to the Army Base Medical Stores.

6. Robertson, loc. cit.

FRAGMENT OF SHELL EMBEDDED IN THE INTERNAL POPLITEAL NERVE:

ILLUSTRATING THE VALUE OF ACCURATE LOCALISATION.

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AND

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THE patient was a second lieutenant, aged 22, who had been hit by two small pieces of shell in the back of the left knee and the back of the left thigh. The wounds healed rapidly without trouble, and there was no sepsis. He was invalided home to the Cliff Military Hospital at Felixstowe. When he began to get about there was acute pain down the inner side of the left leg and foot in the distribution of the left internal popliteal nerve, especially in walking, while any movement of the knee-joint or pressure upon the popliteal space brought on acute spasmodic pain in the nerve. Examination showed a small scar in the popliteal space, and deep pressure at this spot produced acute pain in the nerve; X ray photographs showed a minute fragment of shell deep in the popliteal space. He was then transferred to King Edward VII. Hospital for Officers.

The fragment was localised by Sir James Mackenzie Davidson in the following manner.

The patient was laid prone on the X ray couch, with his toes pointing downwards over the couch-end (Fig. 1). The position was maintained by means of sandbags placed on either side of the leg to be examined. A very small scar on the skin of the popliteal space denoted the point of entrance of the minute fragment of shell which had to be localised, and the cross wires being laid on the part in the usual way their intersection was made to correspond with this scar. Two plates were then exposed, the tube being displaced by 6 cm. for the second exposure, and the localisation worked out with the cross-thread localiser. With the limb in this position the particle of shell was found to be situated at a depth of 30 mm. below the skin of the popliteal space and a mark was placed on the skin by means of nitrate of silver to indicate the point, which was vertically above the position of the foreign body. While the conditions still remained rigid a horizontal line was traced, also with nitrate of silver, along the outer side of the leg by means of a small gauge. This line was parallel with the surface of the couch at a uniform distance of 72 mm. above it and with such an indicator it was possible for the limb to be replaced on the operating table in exactly the same position as it had occupied when the X ray pictures were taken. The surgeon could be sure, therefore, that the conditions under which the localisation was made were exactly reproduced, and that the minute particle of metal was still in a vertical line at the given depth below the marked spot on

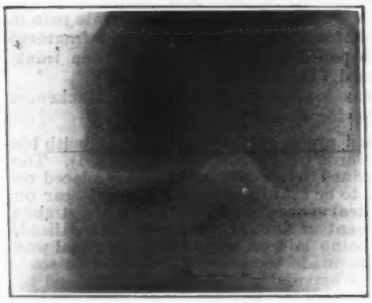
FIG. 1.

To be viewed in a small stereoscope. The leg in position on the X ray couch. The plumb-bob points to the marked spot on the skin, vertically below which, at a depth of 30 mm., the foreign body was known to be lying. This view also shows, on the sandbag, the special director which was used during the operation in order to keep the position after the original mark had been displaced owing to the incision. The surface gauge is also shown at the end of the black line traced by it along the outer side of the leg.

the skin. As a further precaution the special indicator (already described and illustrated),[1] the purpose of which is to enable the surgeon to refer back to a previously ascertained position after the displacement of the skin mark on operation, was brought into use, so that at any moment after incision the exact direction and position of the foreign body could still be made out.

The operation was performed on Jan. 1st, 1917, by Mr. Lockhart-Mummery, assisted by Captain W. B. Ainger, R.A.M.C., Sir Mackenzie Davidson being present. The patient was put in the prone position, and an incision was made longitudinally over the spot indicated by Sir Mackenzie Davidson. This incision was deepened for about 1¼ inches, great care being taken after displacing structures to return them accurately to the plane in which the fragment had been localised. The fragment, which was very small, was reached quite easily, thanks to the accurate localisation, and was found to be embedded in the popliteal vein, one edge of it pressing upon the nerve. The telephone probe was used to verify the foreign body, which was then seized with forceps and drawn out. This resulted in a sudden gush of blood from the popliteal vein through the hole made by the removal of the foreign body which was forming part of the wall. The bleeding was stopped by pressure. In the meantime the wound was sewn up and pressure applied with a wad and bandages. No attempt was made to close the opening in the vein, and no subsequent bleeding occurred. The wound healed quite satisfactorily by primary union. The foreign body proved to be a fragment of shell about the size of the head of a wax vesta.

FIG. 2.



X ray photograph, taken antero-posteriorly, and showing the cross wires and small foreign body.

[1] Surgical Director for Assisting in the Extraction of Localised Foreign Bodies, THE LANCET, 1916, ii., 608.

This case demonstrates not only the importance of precision in the preliminary localisation but also the necessity of ensuring that the part to be operated on is placed in exactly the same position on the operating table as it occupied for the X ray localisation. It would scarcely have been possible to find a small and deeply embedded foreign body such as was concerned in this case had not the surgeon been able to dissect carefully down upon the spot where it was known to be lying. A vague search for such a foreign body could hardly have ended in anything but disappointment, and quite possibly would have been disastrous.

The two plates which furnished the data for this localisation were reduced and mounted as a stereoscopic transparency, and when viewed in a small lenticular stereoscope gave the surgeon a distinct picture in relief. The relative position of the cross wires on the skin and the depth of the foreign body and its relation to the femur were clearly shown, and the surgeon thus had all the necessary information, both the exact measurements and the stereoscopic view, ready to his hand.

FIG. 3.

X ray photograph, taken laterally, and showing two small foreign bodies, lead wires being placed on the scars at the point of entrance. The one nearer to the knee-joint is that which was removed.

AN OCULO-PALPEBRAL PROTHESIS.

BY A. MAITLAND RAMSAY, M.D. GLASG.,
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WHEN an eye has been severely burnt by molten metal, by a caustic alkali, or by a mineral acid, it occasionally happens that the lids and orbit are damaged so seriously that the ordinary artificial eye cannot be worn. In such cases I am in the habit of adjusting an ecblepharon fitted to a spectacle frame. There is nothing original in the procedure, for it was known as long ago as the sixteenth century, and Ambroise Paré's works contain not only a description but also an illustration of that form of prothesis. Few references have been made to it in ophthalmic literature, because cases suitable for its use are of infrequent occurrence. The subject has, however, assumed considerable importance at the present time owing to the large number of soldiers who have been wounded in the head and face, and in some of whom the lids and orbit have been destroyed so completely that there is no possibility of the socket retaining an artificial eye. In such cases a carefully adjusted oculo-palpebral prothesis hides the deformity so satisfactorily that the wounded man can move about among his fellows without attention being drawn to the loss of his eye. He avoids, therefore, the annoyance of unnecessary commiseration, and is placed in a much more favourable position for obtaining employment. The æsthetic value of the prothesis is, indeed, great, and it only requires the spectacles to be lifted to reveal the astonishing change in the appearance when the ecblepharon is removed. It goes without saying, however, that the aid of art ought never to be called in until the resources of plastic surgery have been exhausted, because if the socket can be repaired so that an artificial eye can be retained by the lids an infinitely more satisfactory result is obtained than that got from an ecblepharon, no matter how artistic and unrecognisable.

Each eye must be made to suit the individual case, and different materials have been suggested to replace the damaged lids. The most perfect imitation is obtained when the deformity can be covered by an oculo-palpebral prothesis made wholly of glass. Such an ecblepharon mounted on a silver plate and soldered to a spectacle frame is made by Müller, and in suitable cases it is so realistic that it is only detected after attention is drawn to it. Skilled artists in glass are not, however, always at hand, and different makers of the prothesis have mounted the artificial eye in porcelain, in celluloid, in metal, and in various substances having gelatine as a basis. The drawbacks as well as the advantages of these different preparations are obvious. In the striking case [1] published by Sir William Collins an extensive deformity was hidden by a copper-plate skilfully moulded and painted, and to this a glass eye was attached. Coulomb and Ruppe [2] advise vulcanite, and this is the substance that I have chiefly employed because of the ease with which it can be moulded and painted to harmonise with the surrounding parts of the face. The parts to be reproduced are carefully modelled in wax, and from the model a plaster-of-Paris impression is taken. The soft rubber is then moulded on the plaster-of-Paris and thoroughly vulcanised. The artificial eye is cemented to the vulcanite lids, and after these have been coloured to match the surrounding parts the prothesis is attached to a spectacle frame. The lens in front of the sound eye corrects any error of refraction which may be present, while that in front of the artificial eye is of the curvature which is found to give the best cosmetic result.

Photographs of Cases Illustrating the Oculo-palpebral Prothesis.

[1] THE LANCET, 1916, i., 1217.
[2] Annales d'Oculistique, April, 1916.

The four soldiers whose photographs illustrate this paper have been provided with the oculo-palpebral prothesis through the generosity of some of the ladies visiting the hospital. I am much indebted to them and also to Mr. John Trotter, of 40, Gordon-street, Glasgow, who has taken great pains in the construction of the ecblepharon, and the photographs show that his mechanical and artistic skill have been rewarded by satisfactory results. The immobility of the prothesis is its most serious drawback, but that is a disadvantage which is also present in many cases where an artificial eye is worn in the socket. It is important that all cicatricial contraction is as far as possible completed before the ecblepharon is adjusted, for if any further shrinking occurs a readjustment of the prothesis is necessary.

CASE 1.—Private ——, aged 26, was severely wounded on the left side of the face by a bullet on July 10th, 1916. He was admitted to the 3rd Scottish General Hospital on August 5th. The left eye had been enucleated and a deep adherent cicatrix extended from the inner third of the lower eyelid downwards and outwards one and a half inches across the malar bone. Both upper and lower eyelids were adherent to the tissues of the orbit and pulled backwards by cicatricial contraction. The scar from the lower lid on to the face being very unsightly, was cut out on Sept. 2nd and the edges of the wound were carefully sutured. Captain John Morton, R.A.M.C. (T.), assisted me at the operation, which, however, was not so successful as it promised to be at the time, owing to the occurrence of secondary hæmorrhage two days afterwards. The pressure of the effused blood caused some of the stitches to give way, and the result after healing was completed is well shown in the photograph. The right eye is healthy and vision equals 6/12, measured by Snellen's test-types. The prothesis was adjusted in October and the man was discharged on Nov. 11th, 1916. (Fig. 1.)

CASE 2.—Rifleman ——, aged 20, was wounded by shrapnel on July 2nd, 1916. The bullet struck the left side of the nose, shattering the nasal bones, tearing the right cheek, and damaging the right eye so severely that it had to be enucleated. He was treated for four days at No. 1 Stationary Hospital, Rouen, and then taken to the 3rd Scottish General Hospital, where he was first under the care of Lieutenant-Colonel T. Kennedy Dalziel, R.A.M.C. (T.), who treated the fracture of the nose. He was transferred to the ophthalmic department on Sept. 6th. At that time a suppurating wound extended across the cheek, and the right lower eyelid was completely everted. There was a copious discharge of pus from the orbit, and the upper lid was dragged into the socket and partially adherent to the underlying tissues. Antiseptic dressings were applied, and on Sept. 30th a plastic operation was performed to remedy the deformity of the lower lid. By the end of October the appearances were as represented in the photograph. The left eye is healthy in structure and function, and vision equals 6/9, measured by Snellen's test-types. An oculo-palpebral prothesis was adjusted and the man was discharged on Nov. 11th. (Fig. 2.)

CASE 3.—Private ——, aged 35, was severely injured on the right side of the head by the explosion of a rifle grenade at Souchez on August 14th, 1916. He was taken to a base hospital, where the right eye was removed, and was admitted to the 3rd Scottish General Hospital on August 20th. The right orbit was septic, the lower lid was torn and sloughing, and communicating with the socket there was a large suppurating wound in front of the right ear. Major J. W. Downie, R.A.M.C. (T.), examined the sinuses in connexion with the orbit and reported that they were not implicated. Antiseptic dressings were applied and the suppuration gradually diminished. On August 31st the patient complained of difficulty in opening his mouth, but there was no trouble in swallowing. Antitetanic serum was injected on three different occasions, but there was never any sign of tetanus. The wounds healed slowly, the difficulty in opening the mouth persisted, and considerable swelling of the face remained over the right superior maxilla. Massage and passive movements were applied to the face and lower jaw, and the swelling and stiffness gradually lessened. By the end of December the wounds had healed, but the orbit was so contracted that an artificial eye could not be worn. An oculo-palpebral prothesis was supplied, and the man was discharged on Jan. 6th, 1917. (Fig. 3.)

CASE 4.—Lance-Corporal ——, aged 25, was severely wounded on the left side of the head by the bursting of a shell near Ginchey on Oct. 22nd, 1916. He says he was taken to the 1st Australian Hospital at Rouen, where the left eye was enucleated and an "abscess" of the orbit evacuated and drained. On Nov. 3rd he was admitted to the 3rd Scottish General Hospital. The orbit was sloughing and a deep suppurating wound extended from it outwards to the cheek and upwards on the forehead, where a large area of the frontal bone was exposed. There was also a deep wound of the left parietal region. The wounds and the orbit were kept clean and treated with antiseptic dressings, and antitetanic serum was injected on three different occasions. Healing was slow but uninterrupted in its progress, and by the beginning of January, 1917, cicatrisation was almost complete. The eyelids were drawn backwards and had become firmly adherent to the tissues of the orbit, and the wounds of the forehead and face were represented by deep adherent cicatrices. An oculo-palpebral prothesis was adjusted and the man was discharged. The right eye is healthy and vision equals 6/6, measured by Snellen's test-types. (Fig. 4.)

Glasgow.

THE SURGICAL CORRECTION, WITHOUT CICATRIX, OF UNLOVELY NOSES.

BY DR. JULIEN BOURGUET (OF TOULOUSE),
ASSISTANT SURGEON, LATE PROSECTOR AND CHIEF OF CLINIC, AT VAL DE GRACE.

To rectify, or correct, unlovely noses and to render them acceptable to the æsthetic sense by means of a surgical operation and without leaving any cicatrix appears at first sight paradoxical, in that every surgical operation involves a scar. This kind of operation therefore encounters a certain incredulity, not merely among persons unfamiliar with surgery, but even amongst a number of colleagues. The following letter sent to me last year by the chief of the Medical Clinic at the Faculty of Medicine in Toulouse is sufficient evidence of this.

With the Forces, June, 1916.

On my speaking with colleagues at the field hospital of your nasal corrections without scar they gave expression to a certain doubt. Being desirous of convincing them I should be obliged if you would send me photographs of the cases that we have had the opportunity of operating upon together. D. PUJOL.

This kind of plastic surgery being quite a novelty, such scepticism is scarcely surprising. In France we have to reach the point of correcting any and every case of nasal deformity by operating in the endonasal passage, and it is thus that the cutaneous covering shows not the slightest trace of a scar. By nasal deformity we understand any exaggerated development of the nose in length or breadth, any protuberance or deviation, an exaggerated point, or too broad or too long an extremity. If rhinoscopy is practised after rectification doubt may often arise whether the bistoury has actually been used, for the incision in the mucosa leaves no visible trace; nor is this surprising to rhinologists, who are well aware that after submucous resection of the nasal septum with consecutive suture the area of incision is identical afterwards with other parts of the mucosa not touched by the bistoury.

Rhinoplastic operations belong not only to the æsthetic but to the psychic sphere. The majority of those upon whom we operated did not desire a well-formed nose for elegance, or for purity of line, but rather a nose "like everyone else," one which "does not attract attention." As we expressed it in a communication to the Academy of Medicine in Paris on Feb. 23rd, 1917, the mentality of Cyrano was not created entirely by the imagination of a poet, but was the fruit of keen observation. It would carry us too far to quote the various complaints we have received from patients thus afflicted. Some speak of the prejudice occasioned by this unlovely feature, others of moral suffering or of the pleasantries of which they are the victims. "If there is anything to be done," wrote one of them to us after having described the shape of his nose, "I shall owe you a thousand thanks if you will let me know of it, for it is a source of suffering to me." It is necessary to have seen the emotional gesture with which the patient hurries to the glass at the termination of the operation, and his look of satisfaction on grasping the result, to be entitled to state that it is with them more than the satisfaction of vanity; it is actual moral salvation.

It is generally at puberty that the nose, which presented till then a normal aspect, changes in character, if it may be so expressed. The nose may develop largely in height, producing an exaggerated curvature (Fig. 1 A), or it may be only the medial portion that develops, thus resulting in the hump-backed nose. (Fig. 2 A.) In other cases the abnormal enlargement affects the length instead of the height, giving rise to various forms of pointed nose; in one type the nasal point is unable to bend over towards the chin, in another

bending abruptly towards it. In convex noses, with or without protuberance, and in unduly long noses, the two lateral portions of the nasal projection are symmetrical. In crooked noses these lateral parts are unsymmetrical, one developing more than the other; the result is a nose deviating from the middle line. Of the crooked nose thus formed, the fault may rest with the cartilaginous portion alone (Fig. 3A) or with both cartilage and bone. Noses may, of course, deviate from the straight line, not only as a result of asymmetrical development, but from traumatism.

Finally, in certain cases, an arrest of development may occur at the level of the bony framework, affecting the nasal bones as well as the ascending rami of the maxilla. These bony parts may fall in as a result of acquired syphilis. Traumatism may also result in a similar subsidence. Whatever the origin may be the result is a saddle-shaped nose (Fig. 4A). Other less common nasal deformities occur, but the foregoing will serve as a general outline. All varieties of unlovely nose can be corrected by intranasal operation without, that is, incising the cutaneous covering.

Photographs of Cases taken Before and After Operation.

1A 1B 2A 2B

3A 3B 4A 4B

Operation.

This is always performed under local anæsthesia produced by an injection of cocaine-adrenalin. The mucosa is incised at the desired points; through the incision so made the skin is separated from the bony and cartilaginous framework, and the convexity or protuberance removed with a hand-saw. In certain cases an electric burr is employed. Finally, the skin is allowed to apply itself again to the underlying framework. (Figs. 1B and 2B.)

In pointed noses, when the tip does not descend properly towards the chin, the height of the nasal septum is diminished either with the bistoury or the scissors; and if occasion requires, so that the nostril may not remain too wide as a result of this operation, a portion of cartilage is removed from the ala. When, on the other hand, the tip of the nose is prolonged downwards the length of the septum is diminished by the removal of a triangular segment, and the point of the nose raised by means of sutures. When the point itself projects above the general nasal profile it is brought back into line by an operation on the alar cartilage. Deviating noses are also corrected by way of the endonasal passage. If the deviation concerns only the cartilaginous portion, one or several small prismatic segments of mucosa and of cartilage are removed from the convex side of the septum. The remaining portions are carefully sutured, thus rendering the septum perfectly straight. (Fig. 3B.) If the whole nose deviates the frontal processes of the maxilla are separated obliquely on each side with a saw from the body of the bone and the nasal bones are disarticulated from the frontal. The nose is kept in proper position by a dressing until completely consolidated. Saddle noses are corrected by a bone graft obtained from the crest of the tibia, of size corresponding to the thickness and length required. (Fig. 4B.) When the depression is slight it is readily remedied by an injection of solid paraffin, fusible at 60° C. In certain cases a small thing suffices to give to the physiognomy a more æsthetic appearance, such as the removal of a slight protuberance and raising the point of the nose.

Such are the outlines of the operative technique, and if a comparison is made of the photographs of patients before and after surgical intervention the results obtained may easily be estimated. In conclusion, I repeat that in the operation by the endonasal route there is never any visible cicatrix.

AN EASILY IMPROVISED AND EFFECTIVE METHOD OF OBTAINING PLATE CULTURES OF ANAEROBES.

BY W. JAMES WILSON, M.D. R.U.I., D.SC. BELF.,
CAPTAIN, R.A.M.C.(T.F.); SPECIALIST SANITARY OFFICER AND INSPECTOR OF TETANUS FOR THE BELFAST MILITARY DISTRICT.

ATTENTION being now directed to the study of anaerobic bacteria occurring in wounds, a means of easily obtaining pure cultures without the use of costly appliances seems worthy of report. The methods here described are, as far as I know, original in that no special plates are required. A brief review of previous efforts to simplify anaerobic plate cultures is given. The method can be improvised even under active service conditions and will be found convenient also in well-equipped laboratories. The distinctive features are the interposition of a perforated circular disc between plate culture and vessel containing alkaline pyrogallate solution. The discs I use are made of tinplate 1 mm. in thickness, but copper or glass would serve equally well. According to whether one or two plates or many are dealt with I use Method 1 or Method 2.

Method 1 is convenient for making a few plates. The following are required:—

1. Ordinary sterile Petri dishes. 2. A roll of plasticine or some melted paraffin wax. 3. A round disc slightly larger than the cover of the Petri dish. This can be easily improvised out of biscuit tins. To make a single plate culture anaerobically the surface of the medium is inoculated in the usual way. The medium I have used most frequently is blood-agar prepared by the method of Wilson and Darling[1] or recently boiled glucose agar.

The cover of the Petri dish is firmly fastened to the disc by means of plasticine or melted paraffin. Through the aperture of the disc 10 c.c. of a 10 per cent. solution of pyrogallic acid are introduced into the dish and then 5 c.c. of a 40 per cent. sodium hydrate solution or preferably about 2·5 gm. of the solid alkali. The inoculated plate is at once inverted over the disc and hermetically sealed to it by means of melted paraffin or plasticine. The amounts of pyrogallic acid and sodium hydrate used will, of course, depend on the volume of oxygen to be absorbed, the rule being to allow 1 gm. of pyrogallic acid and 2 gm. of sodium hydrate for every 100 c.c. of space.

Method 2.—If many plates are being inoculated it may be found more convenient to enclose them in a round, deep specimen jar and to invert it over the disc.

If a gas-supply or a Kipp's hydrogen apparatus is available the air in the jar can easily be expelled through an outlet tube by gas introduced through the plasticine by means of a glass or metal cannula. Where this procedure is adopted the last traces of oxygen in the jar can be absorbed by employing the cannula to push over the edge of the aperture a tablet of sodium hydrate into the pyrogallic solution contained in a large Petri dish under the disc. If no gas is available, then a larger volume of pyrogallic solution must be used in a larger vessel underneath the disc.

A neat and cheap appliance is to solder two metal discs together over two metal tubes opening at the central aperture. Over such a disc plates can be piled and then be covered with an inverted glass jar cemented to the disc by means of plasticine. A large Petri dish containing caustic soda solution is attached to the under surface of the disc by a ring of plasticine. When the apparatus is set up coal-gas or hydrogen is passed in through one of the metal tubes and carries the air out of the apparatus through the other open tube. After ten minutes a short length of rubber tube is connected to the exit pipe and a small funnel inserted into its distal end. Ten c.c. of a 10 per cent. pyrogallic acid solution are put in the funnel and the coal gas allowed to bubble through the fluid; the funnel is raised and the gas almost turned off so as to reduce the pressure inside the apparatus and allow of the passage of the pyrogallic solution through the metal pipe into the Petri dish at the bottom of the apparatus. Before all the solution has entered clips are applied to the rubber tubes and air excluded.

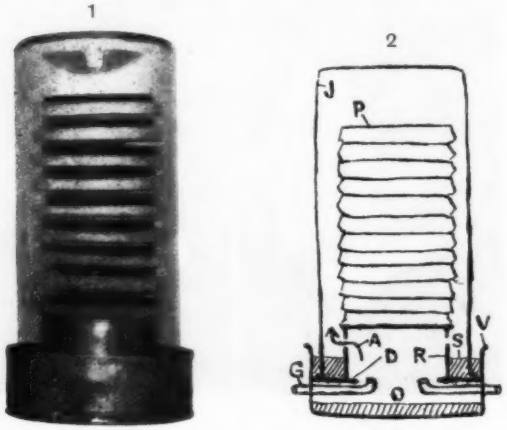
In order to avoid use of plasticine and to have an apparatus which can be used for anaerobic culture either of tubes or plates I have designed and had made to my directions the apparatus shown in Figs. 1 and 2. This apparatus has proved very useful and has given excellent results in practice. The principle of it can be readily seen.

As in other cases, a perforated metal disc separates the oxygen-absorbing fluid from the jar containing the plates or tubes. The disc (D) is soldered to the walls of the lower vessel which also contains in its sides the gas tubes (G). The specimen jar is inverted and its open rim is received into the trench containing liquid paraffin which acts as a seal (S). The walls of the trench are made up of (i.) side of vessel continued up one inch above level of disc, (ii.) of an inner ring of tin plate erected near circumference of aperture in disc. To allow passage of gas through whole apparatus the upper part of this ring is perforated, its edge serving to support the plates or tubes.

That the above appliances give good conditions of anaerobiosis I have proved by the following experiments:—

1. Complete failure of 12 strains of the *Meningococcus meningitidis* to grow whilst the same strains on the same medium grew well under aerobic conditions.

2. Excellent growth on plates of (*a*) *B. enteritidis sporogenes* isolated from fæces; (*b*) of 3 strains of *B. tetani* kindly supplied to the writer by Lieutenant W. J. Tulloch at the instance of Surgeon-General Sir David Bruce, C.B., F.R.S.; (*c*) of the following micro-organisms: (i.) strains from the Pasteur Institute—e.g., *B. sporogenes* Metchnikoff, *B. tetani*,



1. Apparatus for anaerobic culture. 2. Explanatory diagram. A, arrow showing perforation through which the gas passes; D, perforated disc; G, gas tube (the corresponding tube on the right side of the diagram should turn downwards and not upwards as shown); J, inverted jar containing Petri plates; O, layer of oxygen-absorbing solution; P, pile of Petri plates; R, inner ring of tinplate erected on the disc; S, trench containing seal of liquid paraffin; V, tin vessel with soldered-in gas tubes.

Vibrio septique, (ii.) *B. histolyticus*, *B. fallax*, *B. œdem.*, and *B. aerofetidus* of Weinberg, (iii.) two strains of *B. perfringens*. These cultures were lent to the writer by Professor W. St. Clair Symmers, who had obtained them from Captain H. G. M. Henry, R.A.M.C.

3. Decolourisation of the marks of a blue grease pencil and of methylene blue solution either alone or when incorporated in agar.

Method 1 in the use of a perforated plate with ordinary Petri dishes is quite different in technique from any method hitherto described, but some account may be given of methods which resemble it in principle.

Lentz[2] (1910) prepared circular discs of filter paper, soaked them in pyrogallic acid and dried them. A Petri dish was inoculated and inverted over the filter paper, which rested on a flat glass plate and which before use had been moistened with caustic soda. The dish was fastened to the plate by means of plasticine.

McLeod[3] (1913) designed a special porcelain receptacle for the alkaline pyrogallate solution and over it inverted a Petri dish which was provided with a special edge to prevent condensation fluid coming into contact with the plasticine employed to connect the dish to the receptacle.

Kuester[4] (1913) employed special covers for Petri dishes. The cover over which the inoculated plate was inverted had a receptacle to hold the oxygen-absorbing fluid. As an absorbing fluid Kuester employed for every 150 c.c. of air space 2 gm. of acid sulphite of soda dissolved in 20 c.c. of distilled water together with 20 c.c. of a 10 per cent. solution of caustic soda.

Ogata and Takenouchi[5] employed three dishes, one being used to contain the pyrogallate solution. The inoculated plate was inverted over the pyrogallic solution and fluid paraffin or mercury was used as a seal.

Method 1 has the following advantages over those mentioned above: 1. No special glass or porcelain dishes are required. 2. Moisture from the pyrogallate solution condenses on the surface of the metal disc and the surface of the medium is in this way protected from it. Condensation of moisture on the surface of the medium is a serious objection to several of the above methods. 3. The ease with which it can be improvised. Method 3 will be found to give as good results as the well-known apparatus of Botkin, Bulloch, and Novy, and I think will be found much more convenient and cheaper.

References.—1. Wilson and Darling: Brit. Med. Jour., 1916, ii., 900. 2. Lentz: Centrabl. f. Bakt. Orig., 1910, liii., 358. 3. McLeod, S. W.: Jour. Path. and Bact., 1913, xvii., 454. 4. Kuester, 1913: Centrabl. f. Bakt. Ref., lvii., 289. 5. Ogata and Takenouchi, 1914: Centrabl. f. Bakt. Orig., lxxiii., 75.

A NOTE ON

A NEW BONE CLIP FOR THE TREATMENT OF FRACTURES OF LONG BONES.

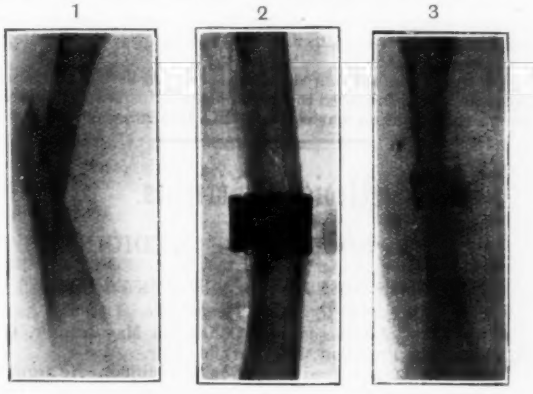
BY JOSEPH E. ADAMS, M.S. LOND., F.R.C.S. ENG.,

SURGEON TO THE EAST LONDON HOSPITAL FOR CHILDREN, SHADWELL; SURGEON, WITH CHARGE OF OUT-PATIENTS, ST. THOMAS'S HOSPITAL; CAPTAIN, R.A.M.C. (T.).

THE operative treatment of fractures has for some time occupied a prominent place in modern surgery, and any method which simplifies or shortens these tedious operations will no doubt be readily welcomed. About a year ago I made use of two clips of tempered spring steel, similar to those illustrated, for the treatment of an oblique fracture of the femur in a small boy, aged 7 years, in whom good position could not be obtained by non-operative measures. The result was very satisfactory, and firm union was obtained in six weeks with a quarter of an inch of shortening. His leg to-day is perfect in function and a skiagram shows satisfactory progress in bone growth despite the partial circular constriction to which the bone has been subjected for nearly 12 months. For various reasons I have not had very many suitable cases under my care requiring operation since this date, but recently I have improved the clip by the addition of a series of teeth turned over from its edge, and these will hold it firmly in place and prevent rotation of the fragments. I find that rarely, at any rate in children, will it be necessary to use more than one clip for an oblique fracture. So well does the new clip work that I have recently applied one for treatment of an oblique fracture of the femur, and now have considerable difficulty in finding the line of fracture in the post-operative skiagram.

In transverse fractures the case is rather different. I have therefore added a flange, so that the fracture line may be splinted by the flange attached to one clip and secured to the other fragment by a clip embracing both flange and bone. (Figs. A and B.)

Circular constriction of bones in the treatment of fractures is open to the theoretical objection that the vascularity of the bone may suffer and lead to arrest of growth or even atrophy, but for some time past Parham and Martin[1] have employed a band of metal which completely encircles the shaft in the case of oblique fractures, and they report no ill-effects. With regard to my clips I may say that I have used them for fractures of the tibia as well as the femur, and they are designed to encircle the bone for not more than two-thirds of its circumference; the addition of the spikes prevents pressure over a large area of bone. In any case there is no process of rarefaction initiated affecting the medulla, similar to that which may follow the fixation of screws through the cortex of the bone, as in the application of Lane's plates.



Skiagram of an oblique fracture of the left femur in a boy of 8 years treated by means of the bone clip. 1. Before operation, Dec. 7th, 1916. 2. After operation, Jan. 4th, 1917. Lateral view. 3. The same. Antero-posterior view.

With regard to the instruments illustrated it will be seen that I show only bone clips and an introducer. As a matter of fact, the only other special instruments required are a pair of curved bone retractors as designed by Sir Arbuthnot Lane. These instruments are of the greatest use in holding the fragments of the bone clear of muscle whilst traction is applied and they are manipulated into position. It will be seen at a glance that the introducer is designed so that the principles of aseptic surgery can easily be complied with, and there is no necessity to touch the clip with anything but the prongs of the introducer, which fit into the loops of the clip. This can then be passed round the bone fully open until the best position as regards fixation of the fragments is found, and then, and not until then, the prongs should be disengaged. This warning is important, as it is difficult to remove the clip when once it is placed in position without disturbing the set of the fracture.

The subjoined skiagrams are of the second case which I have treated in this manner. The patient, a boy, aged 8 years, is now (Feb. 5th, 1917) up and walking about the ward without crutches, with no shortening, and with a

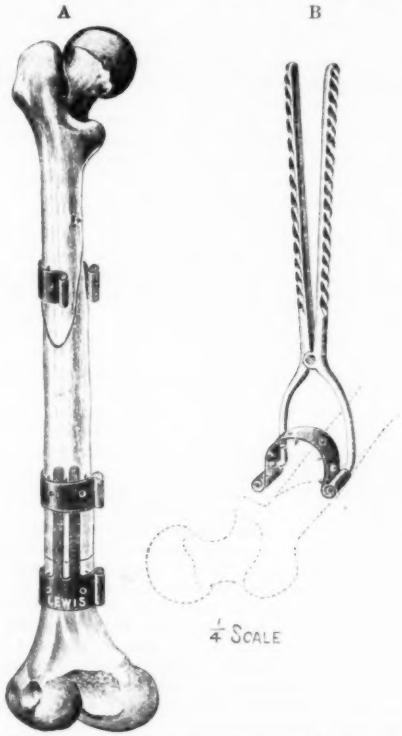


Fig. A shows a transverse and an oblique fracture of the femur, produced by saw-cuts, held in position by clips, drawn from an actual specimen. The upper oblique fracture was easily secured by one clip. The lower transverse fracture is held in good position by one flanged clip and another embracing both flange and proximal fragment.

Fig. B shows the introducer, the prongs of which pass through small loops at the ends of the clip. When this is withdrawn the clip will close tightly on to the bone. This instrument is made with a screw joint so that it can be taken apart.

[1] Surgery, Gynecology, and Obstetrics, November, 1916.

perfectly sound leg. It has been apparently firmly united ever since the third week after operation.

It may be that we have yet to learn what is meant by "primary union" of a fractured bone, and this case appears to exemplify it.

I am publishing this preliminary note as I trust that other surgeons may be attracted by the method sufficiently to give it a trial. Personally, I shall be glad to be rid of the huge armamentarium of Lane's plating apparatus, at any rate for the shafts of long bones, and to be spared the tedious task of applying such plates and screws. With my clip the fixation of the fragments is the work of a few seconds when once perfect apposition has been attained.

The clips and introducer have been made for me by Messrs. Lewis and Co., of Westmoreland-street, W., and I am now having suitable ones made for use on bones other than the femur, which probably does call for operative fixation more frequently than any other bone. It is possible that this method of fixation of fragments may be permissible in the treatment of compound fractures, since it involves no interference with the medulla of the bone. Moreover, union of the bone in an oblique fracture is favoured by pressing the raw surfaces together. If removal of the clip be required at a later date the two halves of the introducer can be separately passed through the loops of the clip, screwed together, and used to withdraw the clip much in the same way as midwifery forceps are employed.

For the accompanying skiagrams of a case before and after operation I am indebted to the Children's Hospital, Shadwell where the operation was performed in December of last year.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF OBSTETRICS AND GYNÆCOLOGY.

Post-Operative Tympanites.

A MEETING of this section was held on May 3rd, Dr. G. BLACKER, the President, being in the chair.

Mr. J. D. MALCOLM read a paper on this subject. He argued that the nervous system of the intestine was temporarily put out of gear by the stimulations associated with exposure and manipulation of the peritoneum during abdominal operations, results being a delayed activity of the propelling function of the alimentary canal and as a consequence some degree of discomfort, nausea, and distension of the abdomen, the action of a purgative being frequently necessary to restart normal peristaltic activity. Occasionally it was impossible to get the bowels to move by any means, and then if there was no other complication a tympanites developed and continued until death took place. In some such cases life could be saved by making an intestinal fistula. This treatment if it effected a cure was followed by a subsidence of the distension and by a movement of the bowels a few days later in response to enemata or to purgatives. The fistula was closed after a time without any subsequent bowel difficulty. Under such circumstances there was clearly no paralysis and no obstruction of any part of the intestine, only a short rest of the lower bowel was necessary to effect a cure. When such cases died unrelieved signs of septic peritonitis were always found at an autopsy if the patient died slowly, because micro-organisms passed from the bowel to the peritoneum when the patient was *in extremis*. But in many such cases there was no spreading peritonitis when a second operation was performed, and therefore the peritonitis followed and could not be the cause of the tympanites. Intestinal adhesions might aggravate the difficulties of the propelling force even if a complete mechanical obstruction was not produced. Opiates also induced symptoms of obstruction. The chief object of the paper, the speaker said, was to differentiate those cases in which trouble began with an inefficient peristalsis from others in which a septic-spreading peritonitis was the first pathogenic condition and was followed by paralysis of the bowel and tympanites. Unless these two classes of cases were recognised many of the conditions following operations upon the abdomen could not be understood, and confusion must arise between the peritonitis which was a cause of tympanites and the peritonitis which was a consequence of tympanites.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF OBSTETRICS.

Hæmatemesis and Melæna Neonatorum.—Vaginal Plug.

A MEETING of this section was held on April 20th, Dr. GIBBON FITZGIBBON, the President, being in the chair.

Dr. BETHEL SOLOMONS read some notes on a case of Hæmatemesis and Melæna Neonatorum. The bleeding started on the day after the delivery, which was uneventful, and large amounts of red blood were passed by the mouth and rectum. The detailed history of the case was given, and the following points were noted:—

1. That the child was a female; the condition being supposedly more common in males. 2. The fact that ice-cold water, which is recommended in these cases, causes great pain; while, when the chill is removed, hæmorrhage does not recommence, and there is no more pain. 3. That starvation can be sustained for so many days (six in this case). 4. That the cure in this case was effected by good nursing, warmth, quiet, water, a mixture of adrenalin chloride and calcium lactate, and the injection of horse serum; that the baby disimproved when the serum was temporarily stopped, and improved when administered again; that large doses of serum give better results than small, and that when given hypodermically or by the mouth the result seems to be the same; that while no anaphylaxis was noticeable in this case, the physician should always be ready for this phenomenon, for which the best treatment is pituitary extract in small doses. 5. That it was possible that the ulceration in the gastro-intestinal tract was caused by some toxin carried from the mother to the child while still in utero.

Dr. E. HASTINGS TWEEDY said that these cases were nearly always due to duodenal ulcer, and horse serum in massive doses appeared to act as a specific. The dose should not be smaller than 10 c.c. It was seldom necessary to repeat the dose. Once the bleeding ceased the infant's condition rapidly improved, and perforation of the bowel appeared never to occur. Starvation was unnecessary for more than two days; breast-milk might then be given.—Dr. SPENCER SHEILL said that he had published notes of a similar case two years ago, the treatment of which by horse serum was the first recorded success. He believed a more rapid and successful result would have been obtained by 10 c.c. doses of serum, instead of the smaller and repeated doses.—Dr. W. M. CROFTON thought the serum must act by inducing a larger production of thrombin, since, if mixed with fresh blood outside the body, it delayed clotting. He described two cases of anaphylaxis occurring after the first injection of serum intravenously, and discussed the probable cause of the change in the serum producing this. These cases had led him to introduce pituitrin for the treatment of anaphylaxis. He criticised the exhibition of lime salts by the mouth, suggesting that they could have been better given in the form of the mother's milk.

Dr. HASTINGS TWEEDY read a paper on the Ability of the Vaginal Plug to Cause a Direct Pressure on the Uterine Vessels and on the Side Walls of the Pregnant Uterus. He said that the plug had a different significance in Dublin from that which it enjoyed elsewhere. It was impossible to cause compression of the uterine vessels if rolls of cotton-wool (each tied round with a string) were passed into the vagina with the aid of a speculum and plugging forceps. If, on the contrary, the left hand was entirely inserted into the vagina and small pledgets of moist cotton-wool were inserted by means of the other hand, it was comparatively easy to press from 30 to 40 separate pieces into the canal and to force up the lateral fornices until a hard tumour could be felt rising high above Poupart's ligament. In the year 1898 he had brought forward evidence that a plug so inserted was able to stop the circulation of the uterine vessels. Recently, in a series of Cæsarean sections, he had been able to demonstrate in a convincing manner that the plug acted in the way explained in his former paper.

MEDICAL STUDENTS IN SWITZERLAND.—The total number of students studying medicine at the Swiss universities during the winter 1916–17 was 1801, of whom 291 were women. Out of this number 726 were foreigners, and of these 185 were women. The students were distributed as follows: Basle, 215; Berne, 411; Geneva, 512; Lausanne, 248; Zurich, 515.

THE LANCET.

LONDON: SATURDAY, MAY 12, 1917.

Science and the Nation.

"WHAT people call Applied Science is nothing but the application of Pure Science to particular classes of problems," said Professor HUXLEY, and thus corrected a popular misunderstanding of the times which still flourishes, if not so freely now as then. For certainly the mass of the public believe that the man engaged in research—the chemist or physicist in the highly organised laboratory attacking specialised problems—is not bringing the mystical qualifications, with which they willingly credit him, to bear upon the practical issues of life. This frame of mind arises from two main causes. The first is the ignorance of the public of the grammar of science, an ignorance displayed even by the men whose daily routine brings them into immediate contact with the results of scientific research. It does not enter into the mental equipment of the average citizen to understand, even in a general way, the terms of science or the obvious phenomena of chemistry or physics. In the factory, the brewery, the railway shed, he knows accurately many things, but his knowledge is utilised for the most part empirically and specially—he has little idea of the general significance of what he is engaged upon. He has never had education along the necessary lines. The second main cause is no less obvious why the public do not perceive that the applied knowledge, which activates the best part of the world's activity, is just the knowledge which at first emanated from research. It is this. The worker in "pure" science does not and cannot announce beforehand that he is going to solve a certain problem, or to make a discovery which will have a certain outcome in "applied" science; hence, when the public come into possession of the results of research, no history reaches them connecting the practical benefits, which the public *can* appreciate, with anything which anyone has previously done in a laboratory. In this way the debt owed to research goes unrecognised, and the oversight may have a specially dangerous sequel to-day. For all can see that after the world-war many industries will have to be rebuilt which rely wholly upon applied science; and there will be an enormous impetus given to the output of all sorts of commodities, the manufacture of which depends upon the use of high technical knowledge. Attempts to go forward on the commercial side without reference to the proper source of energy—namely, research—will be slow, ill-directed, and unsuccessful.

Recognition of this position has inspired a group of Cambridge graduates, holding high positions in their branches of pure science, to write a series of essays demonstrating how research carried on in their various departments has led in the past, and is leading now, to the conduct of the business of life in its most useful, nay, most indispensable, forms. No one needs to be convinced on this point as far as mathematics and physics are concerned, but in other directions the evidence does not lie so clearly in sight, and its production in these essays may be very valuable. Mr. WALTER ROSENHAIN, superintendent of the Metallurgy Department of the National Physical Laboratory, for instance, proves that our immense strides in metallurgy, enabling metal strains to be definitely calculated and "fatigue" avoided, and alloy steels and aluminiums to be manufactured of infinite hardness, started with the invention, in the course of research work by LE CHATELIER, of the thermo-couple for the registration of enormous temperatures, and with the discovery by HENRY CLIFTON SORBY of the crystalline structure of metals; and it is piquant here to recall that the importance of SORBY'S work was quite unrecognised at the time when it was done, while he himself could not have been aware of its great significance. Mr. F. W. KEEBLE, director of the Royal Horticultural Society's Gardens at Wisley, Mr. W. DAWSON, reader in forestry at Cambridge, Mr. R. H. BIFFEN, professor of agricultural botany, and Mr. T. B. WOOD, Draper's professor of agriculture in the same University, show respectively how the methods of intensive cultivation have been discovered by research; how the output of timber, for some time so perilously short in this country, can be largely increased by attention to scientific procedures, planned and tested in the laboratory; how systematised breeding may improve the yielding capacity of wheat, and place the nutrition of farm animals upon a rational basis. More than one of these writers point to the botanical experiments of GREGOR MENDEL in the garden of an abbey as the inspiration of scientific labours that are already bearing famous fruit; for MENDEL, like SORBY, was building better than he knew, and illustrating the impossibility of prophesying what will be the scope or influence of any scientific discovery at the moment that it is made. The examples of the association between research and manufacture given by Professor W. J. POPE, professor of chemistry at Cambridge, in the opening essay of the series, are drawn from the conditions of war, and he points, as we have done already in these columns, to the curious fact that certain great chemical industries, like dyeing and the preparation of synthetic drugs, sources of enormous wealth in times of peace, can be transformed in times of war into manufactories for high explosives. The moral to be drawn here lies on the surface for this country. If we had been able as a nation to receive with intelligence the information from the laboratories of our scientific chemists, we should not have allowed these great industries to be wrested from us by the Germans, who grew fat on them in times of peace, and have employed them against us, to our unspeakable hurt, throughout the war. The nation was deaf to the message of its chemists.

Lord MOULTON, one of our most learned citizens, in an introduction to the essays which highly

commends their study (as we are now doing), believes that the vague and artificial distinction between pure and applied science does not exist as an influential principle in this country. This is excellent hearing for the votaries of medicine, who can show good cause why there should be full appreciation of medical progress. Indeed, medical research, since discovery extended the scope of medicine from that of an art to that of a science, has bestowed through its practical application benefits upon mankind that can no longer escape popular recognition. The essays dealing with the subject are written by Professor GOWLAND HOPKINS, Professor G. H. F. NUTTALL, and Dr. G. S. GRAHAM SMITH, respectively occupying chairs in biochemistry, biology, and hygiene at Cambridge, and they form an admirable exposition of the way in which the highest forms of academic work have rapidly found public applications resulting in the saving already of untold lives. We need not traverse with medical readers the well-known country where the landmarks are the discoveries of PASTEUR, LISTER, KOCH, LAVERAN, MANSON, ROSS, METCHNIKOFF, BEHRING, EHRLICH, GORGAS, WRIGHT, BRUCE, and others, or narrate the wonderful ingenuity and bravery by which the Panama Canal zone was freed from yellow fever; but we congratulate the authors of the papers dealing with medical research upon drawing a map of that country which for all who are commonly intelligent furnishes lucid information upon technical matters of extreme complexity. The last essay, by Captain W. H. R. RIVERS, on the value of anthropological knowledge to an empire which has the charge of many subject races, differs from the other contributions in omitting marked examples of success following the application of scientific teachings; but the writer has no difficulty in convincing us that official blindness to the lessons of ethnology has not seldom had tragic consequences for ourselves and our dependents.

We desire for this excellent little volume[1] the widest possible circulation; it is a winning brief for those who have been advocating for years the endowment of pure research in this country. A start has been made, as far as medicine is concerned, with the Medical Research Bureau, but the satisfactory beginning must have far larger developments.

The Rationing of the People.

THE Royal proclamation issued last week as to the necessity of husbanding our food supplies no doubt brought home to a good many still sceptical and heedless people the seriousness of the situation, and now we have Lord DEVONPORT'S statement in the House of Lords last Tuesday that preliminary steps are being taken to put into force a scheme of rationing the nation. It will necessarily be a vast piece of administrative machinery which will require the utmost care and consideration in regard to detail and its subsequent application to the common affairs of our daily life. We must profit all we can by the experience of the past, and especially from the mistakes of those nations which have attempted a practical and systematic solution of the problem. There are already many lessons before us which should not require to be learned again. In any case we shall be called upon to exercise patience and forbearance, and in this we may be helped by the hope that it will not be long before the situation is relieved in obvious ways. Our physiological authorities have done well to urge not only what are the daily requirements of the individual in regard to the kind and amount of food necessary for maintenance, but also to point out the great importance of basing allowances upon the demands placed upon the energies of that individual. Dr. M. S. PEMBREY, in a paper published in our present issue, refers to this aspect of the question and rightly says that a system of rations which pays no attention to occupation is absurd, for clearly the man who does essential muscular work must have a greater amount of food than the sedentary worker. Otherwise our national efficiency may well be impaired. The particular food needs of the children in the family will call also for special attention; and, indeed, the whole system of rationing, while in any case it must mean exercising considerable economies, must have a logical or physiological basis or the results may be disastrous. The handing out of rations, in other words, must be scientifically fair so far as the situation permits. Lord DEVONPORT said that it was his endeavour to take no measures which would benefit the rich at the expense of the poor. Such preference will be immensely hard to avoid, and can only be avoided by limiting each consumer to the number of calories required to maintain his body heat and perform the work required of him. Any consumption of food in excess of this limit, irrespective of purchasing power, must be made impossible for rich and poor alike, if Lord DEVONPORT'S action is to have effect. This can be secured by getting a return of the routine of the daily life and domestic situation of the individual. All these questions, we are sure, are being carefully considered by the Food Controller, who has, no doubt, received the counsels of the strong advisory body of scientific men placed at his disposal. They are not likely to miss any single point vital to the issue, but if this should happen the error will be immediately detected, when readiness to modify any instructions will be displayed by those in authority, who have always shown themselves ready to take advantage of popular experience.

[1] Science and the Nation: Essays by Cambridge Graduates. With an Introduction by the Right Hon. Lord Moulton, K.C.B., F.R.S. Edited by A. C. Seward, Master of Downing College, Cambridge. Cambridge University Press. 1917. Pp. 328. 5s. net.

DONATIONS AND BEQUESTS.—The late Mr. Joseph Taylor, of The Bungalow, Great Barr, Staffordshire, has left by will £20,000 to the Walsall and District Hospital, £10,000 to the Walsall Victoria Nursing Institution, £5000 to Queen's Hospital, Birmingham, and £2000 each to the Birmingham and Midland Eye Hospital, the Society for the Prevention of Cruelty to Animals, the Wolverhampton and Midland Counties Eye Infirmary, and the Midland Counties Home for Incurables, Leamington.—By will the late Mr. James Forrest, of St. Leonards-on-Sea, has left £5000 in trust, which will ultimately be divided between St. George's, the Middlesex, and the Westminster hospitals and the Victoria Hospital for Children.—The late Mrs. Anne Chambers, of Prince's-gate, W., has left £1000 to the Staffordshire General Infirmary.

Annotations.

"Ne quid nimis."

LESSONS OF THE WAR IN THE MATTER OF WATER-SUPPLY.

RIVERS as sources of water-supply—at least in the cases of the Thames and Lee—were very nearly ruled out some years ago when it was seriously proposed to draw on the watersheds of Wales for the supply of water to the metropolis, following the schemes adopted by Liverpool and Birmingham. Manchester draws its supply from Thirlmere Lake in Cumberland and Glasgow from Loch Katrine. An important difference between lake and mountain supplies and the generality of river supplies is that the former are invariably free from lime salts, while the latter are hard. This last quality is a source of considerable trouble and expense to water consumers in London, and notably to those in the Kent districts where no attempt is made to soften the water derived directly from the chalk wells. Of course, it is of prime importance that attention should be given to organic rather than to inorganic quality, and this is what has been admirably done in the case of the river-drawn supplies to the metropolis. We may, perhaps, hope that now it appears to be well established that raw river-water can be purified to any required standard of safety the future may see a softened supply also. It is doubtful whether a hard water-supply has any prejudicial effect upon the public health, but in many directions the advantages of a soft water-supply are obvious and would result in considerable domestic and technological economies. Dr. A. C. Houston, the director of water examinations, Metropolitan Water Board, whose arduous labours on the subject have brought the metropolitan water-supply to its present constancy and purity, has shown[1] that there are several reasons leading to the belief that rivers are likely to be used to an increasing extent as sources of water-supply. First of all, our sources of supply are limited, and many of the available watersheds are already appropriated. Then the danger of using river water for potable purposes has in the past been exaggerated; although it should be remembered that Dr. Houston is speaking in the light of present important methods of purification largely the outcome of his own investigations. Finally, he says, there are cases where there is an economic gain in the choice or in the retention of a river water-supply, adding "for many years to come, any *legitimate* means of saving money ought to be regarded as a national duty." It was the need for economy which led also to the use of a chlorination method of sterilisation which saved a considerable amount of money and time expended in storage in the great reservoirs. Whether such a course would have been adopted by this time had not these great national economical considerations arisen is a matter of opinion. The end, however, has justified the means. Dr. Houston frankly says he is not pledged to support sterilisation or any other special method of water purification. At the same time he feels that the war has taught us many lessons, including the necessity of subordinating sentiment to expediency. Pure water is a prime necessity of life, and, ideally, to obtain it we should draw on a pure source of supply. But we have to deal with the situation as we find it, and we are faced with an impure supply. The only recourse then is to put into execution methods which without doubt render the raw material wholesome. This Dr. Houston has done, and he is confident of continuing able to do so. It is a responsibility that has been finely undertaken.

[1] Rivers as Sources of Water Supply. By Alex. Cruikshank Houston, M.B., D.Sc., F.R.S. Ed. London: John Bale, Sons, and Danielsson.

THE IMMEDIATE MOVEMENT OF INJURED JOINTS.

AT a meeting of the Académie de Médecine of Paris M. Ch. Willelms, director of the Belgian Military Hospital of Hoogstaede, described his treatment of wounds of joints by immediate mobilisation. In 1909 he first advocated the treatment of hæmarthrosis of the knee by puncture followed by immediate walking. Though opposed to current teaching this treatment obtained supporters at once. Those who had the courage to try it found it superior to other methods by reason of its simplicity, complete innocuity, and rapidity of cure. Extending this treatment, M. Willelms applied it to grave injuries of joints other than hæmarthrosis. From industrial accidents he extended the treatment to military surgery. He is now convinced that the current method of treatment by immobilisation is defective and should be abandoned. It leads to stiffness of joints and atrophy of muscles which never occur under the new method. The former can be avoided by passive movements, but muscular wasting can be completely prevented only by active movements. To prevent atrophy of the quadriceps it is not sufficient that the patient performs movements of flexion and extension of the knee while lying in bed. He must walk. Numerous objections may be made. It may be asked, Is not mobilisation painful? The performance of the function of a wounded joint is not painful, even when there are osseous lesions, provided no displacement is produced. Will not an articular wound render a joint incapable of performing its function? Incapacity occurs only at the beginning when the joint is distended by effusion, and later when muscular atrophy has developed. Will not the lesions be aggravated by the movements? On the contrary, the cicatrisation of articular and periarticular lesions is accelerated by active movements. So far from causing irritation, they favour absorption of effusion and infiltration, thanks to a kind of internal massage so produced. Can the movements aggravate infection? If the joint is closed or insufficiently opened movements may contribute to the diffusion of germs and the extension of arthritis. But if there is a good opening each movement has the effect of expelling pus, and the joint is better emptied than by drainage. Further, movements are the best method of promoting absorption of the periarticular exudation which always accompanies arthritis. In cases of wound of the knee produced by a rifle bullet without fracture there is often only a simple perforation. All that M. Willelms finds necessary is to cleanse and dress the wound. He then allows the patient to walk immediately. But for wounds due to shrapnel, shell, bomb, or grenade he performs free arthrotomy, excises the track, removes the projectile, and sutures the wound. A simple dressing is applied, and the patient is directed to perform movements as frequently and as extensively as possible, even to the

point of fatigue. He begins to walk after a few days, sometimes almost immediately. The same treatment is followed when the articular wound is accompanied by osseous lesions without tendency to displacement. If the damage of the bone is important immediate walking is out of the question, and movements of flexion and extension are ordered, their extent depending on the amount of sound cartilage left. If the greater part of an articular cartilage is destroyed there is no longer anything to call a joint, and mobilisation is without object. If there are extensive bony lesions the possibility of immediate mobilisation depends on the absence of any tendency to displacement of the fragments. If this is to be feared mobilisation must be abandoned. If the arthrotomy has not ensured complete disinfection of the joint arthritis will appear—not in consequence of the movements, but in spite of them. The joint must then be reopened more extensively than before, and while allowed to remain open the movements must be continued. The pus or other fluid will be expelled on each movement and ideal drainage realised.

ALOPECIA AREATA AND PARATHYROID DEFICIENCY.

Alopecia areata, or area celsi as it is often called, is a not uncommon form of baldness. It is rapidly produced and patchy in its distribution; the patches often spread and may coalesce to such an extent as to render the patient completely hairless, though such extreme instances are rare. The common form of alopecia areata is that in which patches or bands of baldness occur on the scalp, characterised by the presence at the edges of hair-stumps shaped like marks of exclamation. The pathogenesis of the disease is obscure. In a few cases the distribution of the bald patch over the area of a cutaneous nerve, and its association with a local neuralgia, has suggested a local neuritis. To explain the ordinary cases three main hypotheses have been invoked. According to one view, the disease is microbic in origin, contagion occurring, although rarely, but no causative microbe has yet been found. According to a second view, it is trophoneurotic in origin, but against this hypothesis it may be urged that the disease is common in childhood and that the bald patches but rarely correspond with the distribution of any nerve. According to a third hypothesis alopecia areata is toxic in origin, the toxin, which is unknown, being either produced locally or carried to the affected area by the blood-stream. A fourth hypothesis of the pathogenesis of the disease has recently been advanced by Dr. G. C. Bolten.[1] He holds that it is a manifestation of latent tetany, and that it is due to deficiency of the secretion of the parathyroid glands. He bases this endocrine hypothesis, as it may be called, on two cases of the disease he has recently treated. One patient was a boy aged 9, the other a greengrocer of 48; both presented a single recognised sign of latent tetany—namely, the presence of Erb's sign—and the older patient in addition had brittle finger-nails and thick skin on the fingers, signs held by Dr. Bolten to be suggestive of latent tetany. Erb's sign consists in an increase of the excitability of the motor nerves to galvanic currents; the other well-known signs of tetany, known by the names of Trousseau and Chvostek, were not present in Dr. Bolten's patients and the Wassermann reaction was absent in both. The elder patient was neurotic, but otherwise in good health, and the boy appeared to be perfectly normal apart from his alopecia. Dr. Bolten does not specify the treatment he gave these two patients and, more particularly, makes no mention of medication with parathyroid gland substance or extract.

[1] Nederl. Tijdschr. v. Geneeskunde, Amsterdam, 1917, i., 24.

THE SANITATION OF PUBLIC BUILDINGS IN THE UNITED STATES.

THE benefits that accrue to the United States from having an organised body of medical health officers united into a Public Health Service manifest themselves in divers ways. For the service has its own inspectors, bacteriologists, laboratories, and chemists, and appears to be hampered by no limitations of scope. It was this service which organised the campaign against ground squirrels in California when there was fear of plague, and which extinguished the now forgotten charlatan Friedmann, who tried to exploit a turtle-grown tuberculin. The latest field of action reported is the sanitary inspection of public buildings in Washington, D.C., the results of which are set out by Dr. J. R. Hurley, of the United States Public Health Service, in a recent issue of the *Military Surgeon*. We learn that in 1912 the officers of the Public Health Service were ordered regularly to inspect all Government buildings in Washington except those of the Navy and Army. Some of these are museums and historic buildings visited by large numbers of people, some are mere offices; they are very various and their management differs accordingly. From the accounts given it is obvious that practices vary, but principles emerge, and to these we direct attention. Thus the best ventilation is held to be by the double supply and exhaust system. Usually the office windows are opened for five minutes in the middle of the morning and afternoon, the staff during these periods "stirring around." Desk fans are advocated and steam heating, the resulting dryness of the air preventing inconvenience from the high temperature reached, which is no less than 78° F. To us it appears no wonder that ice-water is freely supplied. The optimum is considered to be reached at lower temperatures with 76 per cent. relative humidity. Indirect electric lighting is preferred because of freedom from glare and distinct shadows. A cream-coloured ceiling and light shades of buff or green flat-surfaced paint that can be washed are recommended for walls. The Public Health Service makes itself responsible in a detailed way for the lavatory and similar accommodation of employees, and in the Government Buildings at Washington these things appear from the report to be carefully watched. Every Government employee is provided with a clean individual towel once a week, while hot water, liquid soap, and paper towels are in use in the lavatories. Rest rooms for women are fitted up in practically all the buildings where women are employed, sometimes with a matron in charge, and sanitary towels are supplied by automatic machines or otherwise. Stress is laid by the Public Health Service on orderliness of offices. The disorderly office, says the report, cannot be cleaned—papers on the floor cannot be disturbed by the cleaners for fear of loss. Books and papers for record are therefore to be sent to filing rooms promptly, and all coats and hats to dressing-rooms. All unnecessary

pictures are prohibited and the office furniture must be made to stand on feet to permit cleaning underneath. This careful inspection of Government offices at Washington raises the standard of welfare of Government employees, and should improve the whole standard of working office conditions throughout the United States. Official life in England is now very crowded, and we recommend the idea of the general inspection of public offices to the Local Government Board.

A DISCUSSION ON TOXIC JAUNDICE.

A FULL report of the discussion on toxic jaundice in munition workers arising from trinitro-toluene and tetrachlorethane, which took place at the Royal Society of Medicine on Jan. 23rd last, has been issued as a separate volume of the Proceedings at 7*s*. 6*d*. Dr. T. M. Legge, H.M. Medical Inspector of Factories, indicates in his introductory remarks the extent of the problem which industrial toxic jaundice now presents, and its study will be found to throw a flood of light on much that has hitherto been obscure in disease of the liver and blood. The etiology, symptoms, pathology, and preventive measures are dealt with by those who have had the widest experience of this new industrial disease. Dr. H. M. Turnbull, pathologist to the London Hospital, states it as his opinion that the study of the lesions caused by trinitro-toluene in the liver should be of great assistance in the elucidation of the causes of examples of similar atrophy of unknown etiology found from time to time in the post-mortem room, and a similar study of the effect upon the blood and the blood-forming organs should go far to clear up the cause of various forms of so-called idiopathic anæmia. The liver changes are beautifully illustrated by three coloured plates and several microphotographs of specimens prepared by Captain Matthew J. Stewart, R.A.M.C., pathologist to the Royal Infirmary, Leeds. Both he and Dr. P. N. Panton lay stress upon the polymorphonuclear leucopenia, often of extreme degree, found in several cases. Dr. Benjamin Moore, F.R.S., emphasises the probability of absorption directly through the skin playing a leading part in causation, and the importance of clean working as a corollary. A useful summary of the discussion by Surgeon-General H. D. Rolleston concludes the issue.

HEART FAILURE DURING AN OPERATION: HEART MASSAGE AND RECOVERY.

A REMARKABLE example of saving a patient's life after the circulation had failed, during an operation for the removal of tonsils and adenoids, by heart massage, is recorded by Mr. W. M. Mollison in the *British Journal of Children's Diseases* for March. It is remarkable for three reasons. One is on account of the length of time, estimated at 13 minutes, during which the heart stopped beating. In the published records of 13 successful cases of heart massage for a similar purpose which the author has been able to collect, this time-period was usually only two or three minutes, the longest being eight minutes, and, as he suggests, it is open to question whether the heart would not have recovered without the massage in such instances. The second unusual circumstance was that the region in which the operation was performed did not of itself facilitate massage; so that a separate and rapid incision into the abdomen was required in order that the hand, thrust up over the liver, could be applied to the heart, the diaphragm alone intervening. And lastly, interest attaches to the curious cerebral state which continued for some days after the operation. The patient was a boy aged 6 years. He was slight, but healthy in appearance. The anæsthetic, given on an open mask, was a mixture of chloroform, two parts, and ether, three parts. The left tonsil was removed; it was just after the right had been similarly dealt with that respiration ceased, cyanosis occurred, the heart stopped beating, and the pupils became dilated. The abdomen was opened five minutes later, after the ordinary means of resuscitation had been used and failed. The right hand, thrust between liver and diaphragm, easily felt the heart; it was motionless. Pressure was exerted upon the heart at a rate of about 90 squeezes a minute. For some moments there was no response; then some respiratory movements began and continued intermittently. Still there was no attempt at heart contractions. One c.c. of pituitrin was injected directly into the heart and massage renewed; after about 20 more squeezes the heart suddenly began beating strongly. Recovery followed. For the next seven days the boy was more or less unconscious. For ten days there was rigidity of the limbs or choreic movements. Frequently he cried out shrilly (meningitic cry); for 36 hours on one occasion screaming was almost continuous. For 12 days there was incontinence of fæces, and for 15 of urine too. On the tenth day he became very violent and tore his bedclothes. Improvement gradually followed and he made a perfect recovery. The recommendations, in view of this experience, which Mr. Mollison suggests are two: first, that heart massage should not be postponed too long, and, second, that massage ought always to be applied through an abdominal wound.

ANTHRAX IN MAN.

IN the *Journal of Agricultural Research* (vol. viii., No. 2, Washington) Messrs. A. Eichhorn, W. N. Berg, and R. A. Kelser, in a paper on "Immunity Studies on Anthrax Serum," state that considerable amounts of anthrax serum prepared with serum-globulin have been furnished for treatment of the disease in man with highly satisfactory results. Of the serum the curative dose is 40 c.c., administered subcutaneously in four or five places. After an interval of 24 hours a further injection of 25 c.c. may be given, repeated as often as necessary. Larger intravenous injections may be given in advanced cases. The dose of the globulin preparation is based on its proportional concentration, and is usually from 10 to 15 c.c., which can be safely given intravenously. With other types of protein absent the globulin preparation is superior to ordinary serum inasmuch as anaphylactic reaction is minimised. In a number of cases of anthrax in man treated at Bellevue Hospital, New York, it was found that a marked lowering of the temperature and reduction of the œdematous swelling followed the first injection of serum.

THE retirement will be announced shortly of Sir Arthur May, the Director-General of the Naval Medical Service, and we understand that the responsible duties which he has so ably performed will devolve upon Surgeon-General W. H. Norman, C.B.—an appointment which will be esteemed throughout the Service. Since May, 1914, Surgeon-General Norman has been in charge of the Plymouth Royal Naval Hospital.

THE QUESTION OF ECONOMY IN FOOD.

BY M. S. PEMBREY, M.A., M.D. OXON.,
LECTURER IN PHYSIOLOGY, GUY'S HOSPITAL.

IT is the duty of the medical profession to point out clearly the relation between an adequate supply of food and health and efficiency. It is a problem which has been before them for many years and has been investigated from many points of view by scientific men in this and other countries. The results give the clearest guidance in this time of crisis, but the Government have not formed a proper estimate of their value. An attempt will here be made to state clearly the results, which are not disputed, and to indicate the measures which should be employed to meet the restricted supply of food.

Food Requirements of the Body.

The combustion of foodstuffs is a characteristic of life, and in man only ceases with life itself. It is true that men may fast for 30 to 40 days without any fatal or very serious results, as the observations upon the professional fasting men have proved. Water they must have, and food they obtain by living upon their own living substance. This material consumed by a fasting man corresponds to foodstuffs which would yield 1500 to 2000 calories per day. The man is losing weight rapidly, soon becomes incapable of work, and unless the fast is broken will die. If, on the other hand, just sufficient food to maintain life be given, a man at rest in bed requires food with a fuel value of about 1800 calories per day to make good the daily loss, which is due to the "physiological work" of living. Even during the deepest sleep the body is always at work, the heart must continue to pump the blood, the muscles of the chest contract in breathing, and the glands elaborate their products. The two conditions just described give an estimate of the minimum needs of an adult.

The voluntary ration, 4 lb. bread, ¾ lb. sugar, and 2½ lb. meat per head per week, yields about 1200 calories per day, and when allowance is made for women and children is calculated to supply 2000 calories per man. It may therefore be considered a maintenance diet, and with the addition of other food will form an adequate diet for a man doing light work.

There are points of resemblance and also of difference between a man and a machine. No one expects to obtain work from a steam or petrol engine without a proportionate supply of fuel; the more work, the more fuel. There is always waste, and in respect of efficiency the engine is far behind the living body. The points of difference are enormous. The body is not only a transformer of energy, but effects its own repairs, becomes stronger with use, and even reproduces itself. The law of conservation of energy applies to man. For national efficiency the man who does essential muscular work must have a greater amount of food than the sedentary worker, and it matters not what may be their respective wages. The dietary which would be generous for a man or a horse doing no work would be slow starvation if he were forced to work hard each day. A system of rations, therefore, which pays no attention to occupation is absurd. In the following table of standards due to Atwater it will be seen that a man doing very hard work requires twice as much food as the man who does none.

Condition as regards muscular work.	Calories required per day.
None	2700
Light	3000
Moderate	3500
Hard	4500
Very hard	5500

These values are found to be necessary, as the following examples of daily rations will show.

As regards these data it is true that allowance has not been made in all cases for waste; but against this must be set the increase due to the food which is bought to supplement the ration.

[1] Part of a lecture on "The Restricted Supply of Food: its Relation to Health and Efficiency," delivered to the Royal Sanitary Institute, April 25th, 1917.

Examples of Daily Rations.

—	Protein in grms.	Fat in grms.	Carbohydrate in grms.	Calories, total.
Food supplied free, seamen, R.N. ...	91	48	406	2585*
,, ,, ,, boys, ,, ...	107	69	406	2745*
,, consumed by seamen, ,, ...	176	—	—	4080
Food supplied free to four British Regiments	133	115	424	3369
U.S.A. Army (peace ration)	157	140	603	4179
Ordinary prisoners, Scotland, light work, mostly sedentary...	133	35	536	3115
U.S.A. labourers at hard muscular work	177	—	—	6486
U.S.A., very poor working people...	69	—	—	2275
Japan, labourers	118	—	—	4415
Duke of York's Royal Military School (young men)	157	206	472	4614
Boys 9–14 years of age at English Public School	123	97	430	3400
Children over 8 years of age in L.C.C. School	88	66	377	2515

* Allowed also 4*d.* a day to buy extra food.

A system of rations may be necessary under certain conditions, but it is an uneconomical one, and on physiological grounds is unsound. It allows little or no free choice of food and is not readily adjusted to the various factors which determine the need of different qualities or quantities of food. Likes and dislikes are expressions of physiological needs. Healthy men are animals, and when they work steadily and well do not overfeed, even if they have free choice of abundant food. This is well shown by the fact that the average weight of the body remains very constant over long periods, it may be years, in the healthy and active adult, and likewise, as would be expected, the average consumption of food and the output of work.

The limitation of the system of rations is shown by the presence of dry canteens in the Services, the numerous eating-houses in garrison towns and ports, the parcels from home and the "tuck" shops for school-children. Rigid rations, if they are adequate for a large number of men, must lead to waste, for in no other way can allowance be made for various physiological needs.

Regulation of the Supply of Food.

The supply of food may be inadequate in quality, quantity, or in both. The foodstuffs which at the present time must be considered are wheat, meat, milk, sugar, and potatoes. A deficiency in one form of food may be covered by another article which is available. Substitution can by physiological processes be carried further than is possible by the chemist. In the living body sugar and fat can be formed from starch in the food, and the reverse processes are also possible. As a general law it may be stated that as sources of energy the foodstuffs can replace each other according to their values as producers of heat, thus the following are isodynamic quantities:—100 grms. fat, 232 starch, 234 cane sugar, and 243 dried meat. In practice an important factor is the relative cost of the different foodstuffs, which will be considered later.

For a condition of health and efficiency the food should be more than enough to cover the outgoings in the form of heat and work; a balance upon the right side is useful in times of extra or special demand. This is especially the case in the young, for if this balance is not available healthy growth is impossible. Unsuitable food, inadequate in quality or quantity or both, is recognised as one of the chief causes of the terrible mortality of children. The resistance to disease is lowered by unfeeding and lack of exercise, and there are reasons to suspect that the economy of food in schools all over the country has had, and is having, a bad effect upon the health and vigour of the children.

Many men, women, and children are doing hard muscular work which they never did in times of peace; they must have more food if they are to be efficient, and cheap food if they are to save money as they are urged by the Government.

The ideal is a liberal supply of food with free choice. This may be impossible, and the question arises, How is the supply to be regulated in the interests of the nation? The Government have wisely avoided thus far a comoulsory ration, and have made attempts at control by fixed price-

and other methods. The laws of nutrition will still be in force whatever this or any other Government may do, and wisdom would lie in the recognition of the supreme power of natural law. If one foodstuff is deficient a substitute can be found in others, owing to the powers of adaptation of the body and its capacity of converting some forms of food into others. Moreover, the body as an engine can use different kinds of fuel. If coal fails steam may be generated in the engines of a ship by oil, wood, or in emergencies even by burning parts of the ship itself. From this point of view the scarcity of wheat must be considered.

Cereals.—Other corn can take the place of wheat and should be used for this purpose. There is barley and malt used for the production of alcohol, an inefficient form of food at the best and a deadly poison in excess. According to the Food Controller there are 1,000,000 quarters of brewers' malt in this country at the present time; it is not to be used for food, but for the production of beer. The convictions for drunkenness in the Metropolitan Police district and the City for the first quarter of this year were 6176. The Food Controller says that the food value of beer is not disputed, and the Government does not consider it is necessary to save the millions of quarters of barley, malt, and other foodstuffs which are used in the manufacture of alcohol. There may be reasons of policy for allowing alcohol to men in the Services or employed in some essential occupations, but there is none for its widespread consumption. An underfed nation is more dangerous and inefficient than well-fed men, some of whom are aggrieved because they cannot obtain their beer.

Oats can be used as a substitute for wheat, but there is difficulty in obtaining a ready supply; the oats are being kept for the horses. A horse may consume 40 to 80 lb. of oats per week, and hunters and racehorses receive the best. Hunting and racing have been and are allowed; only now is the Government taking steps to consider whether savings in this respect should be effected in the interests of the food-supply of the people. There are thousands of hunters, racehorses, riding horses, and carriage horses used only for pleasure in this country; the consumption of oats, maize, beans, hay, straw, and carrots by these animals must be enormous. With the exception of the hay and straw, which would be useful for cows, all these tons of food could be used by man himself; the objection that the horses are needed as a reserve for breeding and for the Army has no force, for all of these animals could be kept at grass, and under these conditions would liberate many men for essential work.

The percentage composition of these cereals is as follows:

	Protein.	Fat.	Carbohydrate.	Fuel value per lb. Calories.
Wheat flour	8·3	1·0	73·5	1615
Barley, pearled	6·6	1·0	76·1	1630
Maize flour	5·8	1·2	76·3	1625
Oatmeal	13·4	6·6	65·2	1795

All of these substances have been used, even in times of peace, as substitutes for wheat. In some respects oats are a better food than wheat, and the fuel value of one pound is greater than the total for one day of the voluntary ration suggested by the Food Controller. A horse eating daily 10 lb. of oats consumes an amount of cereal food which would be sufficient for 10 to 20 men.

Sugar and Potatoes.—Sugar and potatoes are foods which were introduced into this country in times relatively recent, and it is obvious that they are not so essential as some people imagine. The children should have first claim on sugar, and they could also obtain milk-sugar in milk and malt-sugar in malt, besides those essential substances known as "vitamines." Substitutes for potatoes can be found in other vegetables and the carbohydrates of cereals.

Milk.—The supply of milk is another difficulty, and it has received the attention of the Government. A maximum price has been fixed for the retailer and the producer; the farmers have been selling their cows and giving up the production of milk, notwithstanding the fact that it was a very lucrative business, according to many writers to the daily press. For young children, invalids, and our sick and wounded soldiers milk is a food for which no efficient substitute can be found. During the spring and summer months there may be no serious shortage, for those are the best months, when the cows are at grass, the supply is large and feeding is cheap. There is a shortage at the present time and the coming autumn and winter will show the effects of the reduction of the milking herds. Action, however, must be taken now. Heifers cannot be made into milch cows under ten months. The Government have revised their "milk orders"; the farmers ask for the recall of these orders. In any case a reserve of cows could be provided by the end of next winter if the Government purchased at once numerous heifers and turned them out to graze with young bulls on land owned or taken over by the Government. Even if money were an object the transaction would be probably a very profitable one. A supply of milk should be safeguarded and its cost should be low for the sake of the children, even if it be necessary for the State to give a subsidy.

Other Measures.

If the scarcity of food is general, the true remedy lies in an extension of the supply. Action has been taken at last, pasture has been ploughed up, but the highly fertile ground of the hop-gardens will apparently in many cases still grow hops for beer, instead of corn or potatoes for bread. The hop-growers should have compensation if necessary, but food they should grow, for it is food which is needed.

Another source of food which is undeveloped is the salt and fresh water fish, but this, owing to the supply of cattle, is not so urgent as the question of cereals.

If the cost of food continues to rise difficulties of a serious kind must occur, for a strong man is liable to become dangerous when he is hungry. A corresponding rise in wages does not meet every difficulty. The wage is not adjusted to the size of the breadwinner's family. A great relief and a true safeguard for the present and the future would be the free supply of dinner and tea to school-children; the necessary machinery is simple, if the expense is a general one borne by the State. The health of the future generation could be secured, a great burden would be taken from many hard-working and deserving parents. Foodstuffs which the labouring classes cannot obtain readily or cook could be used in these free meals, and bread would be saved. There would be no danger that the children would be overfed; healthy children are active and growing, and the law of averages as regards food would hold good.

Petty orders, such as the prohibition of Sunday-school treats and cakes, show no appreciation of the laws of nutrition and cause an amount of irritation out of all proportion to the result obtained. The owner of poultry is not allowed corn; the hen does not return in eggs the food value of the food consumed; no animal ever did or ever will, for it must have some for its life, but when allowance is made for the consumption of refuse the hen is economical. The owner of race-horses, hunters, and other horses used for pleasure is allowed in unlimited quantities the very best corn he can buy; he takes the food from the mouths of the poor by outbidding them in the purchase of some of the best articles of food and at a time when there is a great scarcity.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

Maintenance of Irish Asylums.

A SERIOUS financial position has arisen with regard to the Government grant for the maintenance of Irish asylums. The grant has come from an account known as the Local Taxation Account, and the amount payable has been practically stereotyped, regardless of the increasing expenditure of the asylums. At the time the grant was fixed it was sufficient to bear about half the cost of maintenance of asylum patients, but for several years prior to the war this cost was gradually increasing. With the present rate of prices the cost of maintenance has more than doubled since 1914, while the Local Taxation Account, owing to the falling-off in the revenue from licences and other local duties, is no longer able to bear even the stereotyped charge. Up to 1899 the State grant and local rates each contributed about 4*s.* per lunatic per week, whereas it is calculated that in the present year the State will only pay 3*s.* 6*d.* per head, and the balance, at least 13*s.*, must be borne by local rates. The asylums are not alone in misfortune owing to the failure of the Local Taxation Account. Grants are also paid toward

the salaries of Poor-law medical officers and workhouse nurses and of workhouse school teachers, toward the cost of medicines for Poor-law patients, and for some other purposes. All these will suffer, but not to the same extent as the asylums.

The Public Health of Belfast.

That the condition of Belfast from a public health point of view is anything but satisfactory at present is clear to anyone reading the articles appearing in the local papers and also from a perusal of the discussion which occurred at the monthly meeting of the city council on May 1st. Between March 18th and April 21st of this year the average annual death-rate from all causes was 21·8, while in the corresponding period of 1916 it was 20·7; and 188 cases of infectious disease were notified, compared with 115 in the previous five weeks and 169 in the corresponding period of 1916. Altogether 37 cases of typhus had occurred in the recent epidemic, while upwards of 100 new cases of typhoid have been notified during the eight weeks up to the middle of April. The chairman of the Public Health Committee was unable to assign any cause for the origin of the typhus outbreak beyond the fact that ships came to Belfast from foreign ports, which might have brought the disease to the city—an explanation sufficient to cover the occurrence of any form of infectious disease in any maritime town at all times and seasons. As to the typhoid, in the district principally affected—Ballymacarrett—the health committee put forward as an explanation the eating of shell-fish, a view medical expert opinion in Belfast would certainly not endorse. Nothing was said as to insanitary domestic conditions. Then one of the aldermen of the city council made a very severe attack on the corporation scheme for dealing with tuberculosis, which began in May, 1913. The scheme was, he said, costing £31,600 a year now, instead of £15,000 as formerly, without obtaining any results, and he mentioned that in the first quarter of 1917 the death-rate from tuberculosis had exceeded anything experienced for the past 15 years. In 1911 the deaths from phthisis in Belfast were 802, while in 1916 they were 828, and during the three months from Dec. 16th, 1916, to March 16th, 1917, 290 deaths occurred from pulmonary tuberculosis, a figure much above the average. The monthly figures were respectively 93, 85, and 112. In 1914, from the middle of January to the middle of March, 139 deaths took place from phthisis, while during the same period in 1917 there were 197. The corporation scheme for dealing with infantile mortality has not yet been launched, and although £32,000 a year are being paid for street cleansing, not a municipal water-cart was used until last week, and dust, full of microbes, was being blown into the houses. In a word, notwithstanding that more money is being spent, the public health of Belfast is not improving, and no real scientific attempt is being made to grapple with the great questions of public health that are now being considered in England and Scotland.

Belfast and the War Office.

The action of the War Office in dealing with Irish medical schools and with Irish doctors requires some explanation, as is apparent from what appears in THE LANCET of May 5th, p. 704, where, in reference to a Dublin hospital for France, it is said a similar offer on more than one previous occasion was refused when made by Dublin, and also when offered by Belfast in 1915, and by Cork more recently. Not only are these facts accurate, but it may be added that again last week Sir Alfred Keogh, Director-General A.M.S., refused a second offer from the medical profession in Belfast. As a result, the president of the Ulster Medical Society has written Lord Derby, asking him to explain his letter urgently calling for doctors, with this refusal on the part of the heads of the Royal Army Medical Corps, at the War Office to accept the second offer from the members of the Belfast Medical School. Another matter causing great annoyance is the fact that experienced hospital surgeons, who on high patriotic grounds have offered their services, are told that they can join with the rank of their pupils a few days qualified, and go to a camp to be trained, when some of them thus treated have actually been doing all the operative work at the Belfast Military Hospital. At the same time the ranks of lieutenant-colonel and captain are given to others on their first appointment as temporary medical officers of the Royal Army Medical Corps.

Correspondence.

"Audi alteram partem."

THE NEGLECT OF VACCINATION.

To the Editor of THE LANCET.

SIR,—The Local Government Board has recently inquired from the local authorities as to the isolation accommodation for small-pox cases, and the replies generally in the West of England cannot, it seems, be described as satisfactory. This is to be much regretted, as owing to the decrease in vaccination it is essential that adequate isolation should be provided. The neglect of vaccination has probably not had the attention it demands, and this is the feeling of public vaccinators in most districts. In several towns in the West the number of conscientious exemptions exceed largely the number of successful vaccinations. It would be as well to have the term conscientious objection more clearly defined, often it is only ignorance that is implied when the expression is used. A man told me that he never had his children vaccinated; he had a "conscientious objection" to the operation, as he did "not want matter put into his children's arms." This parent was a member of a board of guardians, and had voted against vaccination whenever that subject was discussed at the meetings. Legal proceedings are practically never taken against parents for neglecting to have their children vaccinated, and perhaps this is wise, for the delinquents have often been fined a few coppers, and these fines are paid by the antivaccination societies.

The operation of vaccination is performed differently by many medical men; the public vaccinator has to make four marks, the private practitioner has liberty to make the number he prefers. In some centres there are one or two medical men who vaccinate in one place, and they vaccinate hundreds of children annually. I have seen the resultant scars of some of these cases, and they are almost microscopical in size. These vaccinations might be described as evasions of the law, and the protection conferred by them against small-pox must be extremely limited. After the war the whole subject of the performance of vaccination will have to be gone into, for the annual returns show a large decrease every year in the number of successful cases. The question would then be discussed as to whether any certificate of successful vaccination should be accepted unless it states the number of marks obtained, this number to be fixed by the authorities.

Another point open for debate is whether the public vaccinator should not be abolished, and the parents allowed to have their own medical attendant to perform the operation, the fees being paid by the State. This would make vaccination more popular with the parents, as the family practitioner would be preferred to the public official.

Doubtless several changes will occur in the administration of the Vaccination Acts, and if vaccination could be carried out more efficiently and revaccination enforced, the isolation accommodation at present available would be probably more than sufficient. I am, Sir, yours faithfully,

Lyme Regis, May 4th, 1917. JAMES D. STAPLE.

THE TECHNIQUE OF LUMBAR PUNCTURE.

To the Editor of THE LANCET.

SIR,—The contretemps which Mr. Sheffield Neave has experienced (THE LANCET, May 5th) must be, I think, very unusual, and it is remarkable that it has occurred in his practice three times. It is unlikely that he has met with three cases of congenital abnormality of the vertebral column, which have required lumbar puncture. It is also unlikely that he has struck an intervertebral disc without blunting his needle considerably. It is more likely that he underestimated the distance across the bony canal. I entirely agree with him in his remark about the value of revolving the needle in order to establish or increase the flow of fluid. Another device for the same purpose is to make the patient cough, or, if he is sitting up, to get him to raise his head slightly. It is useful to make a practice of operating below the fourth lumbar spine. Frequently when blood is met with here the fluid will be clear at the higher levels. This, no doubt, is

more often the case when the patient is sitting up on a stool. I always use a syringe as a handle for the needle. It serves also to wash the needle through when a fresh puncture is necessary and at the completion of the operation. Several sterilised test-tubes should always be at hand. It must be remembered that a little blood does not interfere at all with the cytological examination of the fluid or of the Wassermann reaction. In the former case the necessary adjustment can be made readily by simple arithmetic; for the Wassermann reaction the pathologist requires to have the fact that the fluid contained blood in his mind when he reads off the result of the test. To my mind the "Barker" needles are needlessly large. Fine needles of platinum-iridium, which I first saw used by Colonel Purves Stewart five years ago, make lumbar puncture practically a painless operation. The skin is sprayed with ethyl chloride. Over and over again patients have told me that they felt no pain whatever, and a medical man, whom I punctured recently, told me at the end of the operation that he did not know that I had commenced. The fineness of the needles has, in my hands, offered no difficulty in the case of intrathecal injections. My two needles, which are in use almost daily, are those which I bought five years ago. About once a year they require straightening out. Personal attention to one's needles is essential.

The high incidence of neurological syphilis in the Navy brings with it a large experience of lumbar puncture work. In the last ten months at Haslar, for instance, we have done some 250 lumbar punctures in the neurological department. In only one case was the resulting discomfort sufficient to cause the patient to ask that the operation might not be repeated. I agree with Dr. T. J. Horder (THE LANCET, April 28th) that a "dry puncture" is another word for an unsuccessful operation. With reference to Surgeon F. A. Williamson's dilemma (THE LANCET, April 21st), surely a "mistake in diagnosis" should not occur if the cytology of the fluid is examined. This is of far greater importance than the estimation of the pressure of the fluid. The determination and the enumeration of cells requires only a bottle of stain, a graduated pipette, an ordinary hæmocytometer, and a microscope with a 1/6th inch objective.

I am, Sir, yours faithfully,

HILDRED CARLILL, M.A., M.D. Cantab., M.R.C.P. Lond.,
Neurologist to the Royal Naval Hospital, Haslar.

R.N. Hospital, Haslar, May 6th, 1917.

THE USE OF STATISTICS IN MEDICINE.

To the Editor of THE LANCET.

SIR,—This is not the time, nor can you provide the space, for a discussion of the proper use of statistical methods. The "wise sayings" of Sir Almroth Wright which you endorse have already been commented upon at length by me in your columns (January, 1913). But I do venture to ask, in all seriousness, whether this is the time once more to trot out that pantomime elephant, the imaginary "statistician," who insists on masses of heterogeneous data and refuses to pay attention to small groups of homogeneous observations and to contrast that comic animal with the expert (also imaginary) who can deduce absolute truth from half a dozen intensively studied cases.

I do not blame your contributor for not knowing that for several years English statisticians have been at work on the problem of the small sample, any more than I blame the publicity department of the Food Ministry for issuing guesses as to the quantity of food wasted in private families without studying the exact investigations of this point published 17 years ago by Atwater's collaborators; nobody can be expected to read the literature of a subject upon which he means to advise the public—it would bias him. But if I go to the expense of having six absolutely true dice cut, and if on the first trial they all throw a 5, and I at once recommend the gambling public to put their money on 5 in future dicing, I wonder whether your contributor will contrast me advantageously with Weldon and other statisticians who went to the trouble of making thousands of tosses with the ordinary dice of commerce, and whether he will draw that moral of his—viz., when a shorter and a longer way are open, it is not well to choose the longer. On the whole, I do not think he will. But if I were to say that a profound knowledge of the peculiarities of dice, *my* dice, had satisfied me that it really was a certainty that the 5 would turn up and that other observations inconsistent with this view were due to want of technical knowledge on the part of the observer, he would no doubt take my word. Perhaps the gambler would, too, and perhaps he would not be *quite* satisfied in the long run.

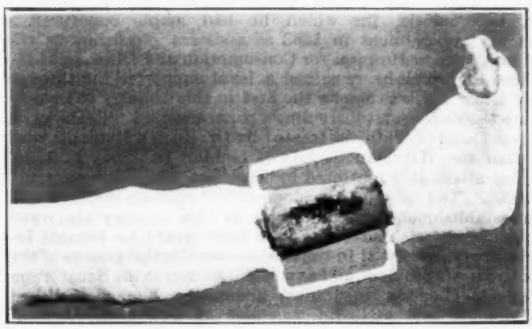
I am, Sir, yours faithfully,

Lister Institute, S.W., May 5th, 1917. M. GREENWOOD, Jr.

BRIDGED PLASTER SPLINTING.

To the Editor of THE LANCET.

SIR,—Referring to the method of plaster splinting described by Captain George Davis in THE LANCET of Feb. 24th I may say that this method of applying plaster has been in use in Boston, Mass., for a number of years and it was when I was a student in Boston that I learned this method. It was used extensively at the American Ambulance in Paris by Dr. Osgood, of Boston, when he was on service there. I have referred to bridged plaster in my recent book on Military Surgery, and the appended photograph shows the splint in use.—I am, Sir, yours faithfully,



Bridged plaster splint applied for an infected gunshot wound of the leg in order to facilitate dressing and at the same time immobilise the fragments.

D. PEARCE PENHALLOW,
Chief Surgeon, American Women's War Hospital.

Oldway House, Paignton, South Devon, April 14th, 1917.

A SIMPLE METHOD OF APPROXIMATING THE EDGES OF WOUNDS.

To the Editor of THE LANCET.

SIR,—I venture to suggest a mode of uniting the edges of wounds which is original, though perhaps not new. It is especially useful with children and in cuts or operations about the face where stitch marks are sometimes more noticeable than the actual scar of the wound.

After preparing the wound, take a suitable number of pieces of silk thread about 4 in. long, each with a knot at the end, and arrange them across the wound just where stitches would be placed. Then fasten down the knotted ends with strapping ¾ in. broad, with its edge half an inch from the wound, and turn the loose ends back. Having similarly prepared the other side, it only remains to draw the edges of the wound together and tie the ends in pairs. For small operations one has time to adjust the silk ends and strapping ready for use, and the former may be passed through the strapping to make it even more secure. I have always used Johnson's adhesive strapping, which keeps the silk quite firm, only the latter must not be wet.

This method might be used for larger wounds to supplement stitches, or to replace those which have given way, or to relieve tension. I am, Sir, yours faithfully,

GEORGE A. BALLINGALL.

St. Leonards-on-Sea, May 2nd, 1917.

THE American National League of Nursing Education has elected Mrs. Bedford Fenwick as their first honorary member in recognition of her labours for the higher education and registration of nurses. The League is composed of all the leading superintendents of training schools for nurses in the United States.

Obituary.

JOHN EDWARD SQUIRE, C.B., M.D. LOND., F.R.C.P. LOND., D.P.H. CAMB.,

CONSULTING PHYSICIAN, MOUNT VERNON HOSPITAL FOR CONSUMPTION, ETC.

WITH the death of Dr. J. E. Squire at his house in London on May 2nd, at the age of 62, the medical profession is the poorer by the loss of one who may justly rank with the pioneers in the modern study and hygienic management of tuberculosis.

John Edward Squire was born in 1855, the son of the late Dr. William Squire, and was brought up in a medical atmosphere with the best of professional traditions. He was educated at University College, London, obtaining his M.B. Lond. in 1881 and his M.D. in the following year, when he became house physician at University College Hospital. Quite early in his career he was attracted to the study of tuberculosis, for which he had ample opportunities on his appointment in 1882 as assistant physician to the Mount Vernon Hospital for Consumption and Diseases of the Chest, of which he remained a loyal supporter all through his life. He was among the first in this country to investigate the claims of tuberculin, a paper entitled "Remarks on Some Cases of Phthisis, treated by Dr. Koch's Method," read before the Harveian Society of London in January, 1891, being afterwards reprinted in his "Essays on Consumption" (1900). The effective development of open-air methods and the establishment of sanatoriums in this country also owed much to his wise advocacy. In later years he became increasingly interested in the medico-sociological aspects of the tuberculosis problem, and as medical adviser to the Sanatorium Benefits (London Insurance) Committee he accomplished invaluable service. He was also an active member of Council of the National Association for the Prevention of Consumption, and a corresponding member of the International Association for the Prevention of Tuberculosis.

Dr. Squire construed his civic duties in a wide sense. In 1885 he served as senior medical officer under the Red Cross in the Soudan Campaign, obtaining the Egyptian medal and the Khedive's bronze star. From 1898 to 1904 he devoted much time and energy to the development of London companies of the R.A.M.C., and on retiring was granted the C.B. and a Volunteer decoration. This service gave him the necessary experience to write a useful manual entitled "Medical Hints to Medical Officers temporarily employed with Troops," issued in 1915 as an Oxford War Primer, his last published writing. Among other awards he received the Queen Victoria Jubilee medal, the King Edward VII. Coronation medal, and King George V. Coronation medal. He was also a Knight of Grace of the Order of St. John of Jerusalem. In addition to the books already mentioned Dr. Squire made many contributions to contemporary medical literature, of which his "Hygienic Prevention of Consumption" (1893) and "Preservation of Health" (1900) attracted most attention. A valuable paper on the "Incidence of Tuberculosis in Children" appeared in our columns in 1910.

One of his colleagues and personal friends writes :—

For over 20 years it has been my privilege to have been closely associated with the late Dr. Squire as a colleague and in private life. He was one of the most hard-working and energetic men whom I have ever met. A glance at the number and variety of the appointments which he held from time to time, and to all of which he devoted himself with self-sacrificing zeal, will show that he was a man who sought a multiplicity of duties, though his name is associated chiefly with tuberculosis and though in later years his professional work was almost entirely in this direction. For example, he took a foremost part for many years in the organisation of the R.A.M.C. (T.) and was, I believe, on his retirement the senior officer in that branch of the service. At the time of the South African War he was largely instrumental in organising and sending out a Territorial Unit, for which work, among other things, he received the C.B. Of late years much of his time was devoted to the activities of the London Insurance Committee, where these had reference to the tuberculosis and sanatorium benefits under the Act. Here his talent for organisation was of the greatest service, for the general campaign for the prevention of consumption was one of his most profound interests. He took a very active part in the foundation of the St. Marylebone Dispensary, of which he was chairman for some years, and recently had been working very hard over the starting of a scheme for the after-treatment of the tuberculous when they had been discharged from hospitals and sanatoria. When it was pointed out to him that, in spite of all his work, his name did not appear prominently in the matter, it was characteristic of him to reply, "That does not matter so long as the work gets done," and it was a source of the greatest gratification to him to see the practical progress that was being made. He was a most conscientious man, and, perhaps, incurred the charge of being changeable from the fact that he examined every problem closely, and was prepared to revise his judgment. He was not an accessible man; there was a certain aloofness and even brusqueness in his manner upon occasion, and these two characteristics, great conscientiousness and a kind of shyness, led to his being often misunderstood by those who only knew him slightly. He was really a very sensitive and highly-strung man, with very strong feelings and affections. The loss of his only son at Neuve Chapelle was a blow from which he had not recovered when his own time to pass over came suddenly in the midst of his labours. His memory will always be held in affectionate esteem and respect by all those who really had his friendship.

Concerning his personal qualities, another of his colleagues at the Mount Vernon Hospital writes :—

Dr. Squire possessed a genius for taking pains. Cautious, patient, reliable as a clinician, he was an able organiser and a tactful administrator. As a teacher he was lucid in exposition and ever ready to devote time and thought to the consideration of essential details. He was, as a result, much in demand as a lecturer. By his premature death medical science has sustained a heavy loss and the health service of the community has been deprived of a man who gave his best for the sake of the people. He died as he would have wished, in harness, a valued companion and trusted counsellor to the last.

Dr. Squire married in 1894 Mary Lily Youngman. His widow and two daughters survive him, and for them the deepest sympathy will be felt.

THE LATE MR. F. W. FOWKE.—On April 27th there passed away at his residence, Byfield, Northants, at the age of 73, Frederick William Fowke, M.R.C.S. Eng., M.R.C.P. Edin., L.S.A. Lond., who had, until his retirement in 1900, been for many years a highly trusted practitioner of the neighbourhood. Born in 1844, the eldest son of the late Frederick Gustavus Fowke, of Charlwelton, he was educated at Leamington, later qualifying as a medical man after studentship at Guy's Hospital. He practised in Byfield from his hospital days, and his services were widely known and valued among all classes. He leaves a widow and three sons.

URBAN VITAL STATISTICS.

(Week ended May 5th, 1917.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at nearly 17,000,000 persons, the annual rate of mortality was 15·7, against 18·4 and 16·7 per 1000 in the two preceding weeks. In London, with a population exceeding 4,000,000 persons, the death-rate was 15·4, or 1·4 per 1000 below that recorded in the previous week; among the remaining towns the rates ranged from 7·5 in Wallasey, 7·9 in Eastbourne, and 8·0 in Ealing to 23·5 in Middlesbrough, 23·6 in Halifax, and 25·5 in Stockton-on-Tees. The principal epidemic diseases caused 450 deaths, which corresponded to an annual rate of 1·4 per 1000, and included 280 from measles, 64 from infantile diarrhœa, 63 from whooping-cough, 33 from diphtheria, 7 from scarlet fever, and 3 from enteric fever. The deaths from measles were slightly in excess of the number in the previous week, and caused the highest annual death-rates of 3·4 in Salford, 3·6 in Middlesbrough and in Sunderland, 3·8 in South Shields and 6·2 in West Bromwich. The 739 cases of scarlet fever and 1203 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital were respectively 19 above and 9 below the numbers remaining at the end of the previous week. Of the 5119 deaths from all causes in the 96 towns, 158 resulted from violence. The causes of 39 deaths were uncertified, and included 10 in Birmingham and 4 each in Liverpool and Sunderland, but not one in London.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2,500,000 persons, the annual death-rate was equal to 17·2, against 18·1 and 18·4 per 1000 in the two preceding weeks. The 399 deaths in Glasgow corresponded to an annual rate of 18·6 per 1000, and included 38 from whooping-cough, 33 from measles, 3 from diphtheria, and 1 from scarlet fever. The 120 deaths in Edinburgh were equal to an annual rate of 18·9 per 1000, and included 25 from measles, 7 from whooping-cough, 2 from infantile diarrhœa, and 1 from diphtheria.

Irish Towns.—The 163 deaths in Dublin were equal to a rate of 22·0 or 1·6 per 1000 above that recorded in the previous week, and included 8 from measles, 3 from whooping-cough, and 1 from diphtheria. The 125 deaths in Belfast corresponded to an annual rate of 16·6 per 1000, and included 3 each from enteric fever and infantile diarrhœa, and 1 each from scarlet fever and typhus.

The War.

THE CASUALTY LIST.

THE following names of medical officers appear among the casualties announced since our last issue :—

Killed.

Capt. E. Harrison, R.A.M.C., attached Gloucester Regiment, was educated at Cambridge and at St. Bartholomew's Hospital, London, and qualified in 1904. He held appointments at the Hospital for Women, Soho, London, and at the Scarborough Hospital, and was in practice at Leicester prior to joining the R.A.M.C.

Lieut.-Col. (acting Col.) F. A. Symons, R.A.M.C., C.M.G., D.S.O., A.D.M.S., qualified at Edinburgh in 1891. He joined the R.A.M.C. in 1893 and was promoted Lieutenant-Colonel in 1915. He saw service in the South African War, taking part in the relief of Ladysmith, and received the Queen's medal with three clasps. He was awarded the D.S.O. in February, 1915 (THE LANCET, Feb. 27th, 1915, p. 469), and the C.M.G. at the close of last year (THE LANCET, Jan. 6th, 1917, p. 37).

Capt. P. E. Lones, R.A.M.C., was a student at University College Hospital and qualified in 1915, and thereupon joined up.

Died of Wounds.

Capt. J. B. Tackaberry, I.M.S., was a student at Middlesex Hospital and qualified in 1909. He joined the Indian Medical Service in 1910 and was promoted Captain in 1913.

Surgeon-Major A. H. Palmer, Staffordshire Yeomanry, was educated at Birmingham University and at Guy's Hospital, London, and qualified in 1895. He had been associated for some years with the Yeomanry, and died at Cairo on May 2nd.

Lieut. J. A. S. Burges, qualified at Glasgow in 1910, and held appointments at the Consumption Sanatorium, Bridge of Weir, and at the Glasgow Western Infirmary and the Glasgow Maternity and Women's Hospital. Prior to joining the R.A.M.C. he was in practice at Carronshore, Stirlingshire, and was medical officer of the parish of Airth.

Died as Prisoner in Turkish Hands.

Capt. K. K. Mukerji, I.M.S.

Missing, believed Drowned.

Lieut. J. Marshall, R.A.M.C., was educated at Edinburgh University and qualified in 1908. He was at one time house surgeon at the Darlington Hospital and later was in practice at Lancaster. Before joining the R.A.M.C. just recently he was on the staff of the Beaufort Military Hospital, Bristol.

Lieut. J. Rae, R.A.M.C., was educated at Aberdeen University and at University College, London, and qualified in 1909. He held appointments at the Cheltenham General Hospital, at the Connaught Hospital, Aldershot, and at the Park Hospital for Children, and was on the staff of the 1st Birmingham War Hospital before joining the R.A.M.C. in February last. He had made several contributions to medical and to other literature.

Lieut. M. W. Danzig, R.A.M.C., came from South Africa and qualified at Edinburgh in 1915, and joined the R.A.M.C. so recently as March last.

Lieut.-Col. A. C. Fox, D.S.O., R.A.M.C., was a student at the London Hospital and qualified in 1891. He joined the R.A.M.C. in 1894 and was gazetted Captain in 1897 and Lieutenant-Colonel in 1915. He was awarded the D.S.O. in February, 1915 (THE LANCET, Feb. 27th, 1915, p. 469).

Lieut. W. Grier, R.A.M.C., was educated at Glasgow University and qualified in 1905. He held appointments at the Eye Infirmary, at the Western Infirmary, and at the Maternity Hospital, Glasgow, and was in practice at Barrhead prior to joining the R.A.M.C. in the early part of this year.

Lieut. W. T. Harris, R.A.M.C.

Lieut. J. G. B. Smith, R.A.M.C., was a student at St. Bartholomew's Hospital, London, and qualified in 1915. He joined up quite recently.

Lieut. R. Stewart, R.A.M.C.

Wounded.

Capt. H. E. Creswell, R.A.M.C., attached K.R.R.C.
Capt. W. T. Collier, R.A.M.C.
Capt. R. H. MacDonald, Canadian A.M.C.
Capt. A. H. Wallace, Canadian A.M.C.
Capt. H. C. Wallace, Canadian A.M.C.
Capt. G. B. Lowe, Australian A.M.C.
Capt. F. E. S. Willis, R.A.M.C.
Capt. J. Fraser, M.C., R.A.M.C. attached Devon Regt.

DEATHS AMONG THE SONS OF MEDICAL MEN.

The following sons of medical men must be added to our lists of those who have fallen during the war :—

Lieut. J. L. Fowlie, Highland Light Infantry, elder son of Dr. P. Fowlie, of Singapore.

Second Lieut. D. N. O'N. Humphrey-Davy, Hampshire Regiment, younger son of Dr. A. Humphrey-Davy, of Bournemouth.

Capt. L. Profeit, King's Shropshire Light Infantry, youngest surviving son of the late Dr. A. Profeit, Commissioner to Queen Victoria at Balmoral.

Second Lieut. H. W. F. Cooper, Royal Fusiliers, only child of the late Mr. T. H. Cooper, M.R.C.S., of Hampstead, London.

Surgeon-Major A. H. Palmer, Staffordshire Yeomanry, eldest son of Dr. C. Palmer, of Burton-on-Trent.

Capt. G. L. Pagan, Royal Scots, son of the late Dr. Pagan, of Bothwell, Lanarkshire.

Capt. P. A. Hill, South Wales Borderers, only son of Col. P. E. Hill, A.M.S., of Crickhowell, Breconshire.

Second Lieut. G. H. Mapleson, Queen's Royal West Surrey Regt., youngest son of the late Dr. H. T. Mapleson, of Nottingham-place, London.

Lieut. W. D. L. Purves, East Lancashire Regt., youngest son of Dr. W. L. Purves of Stratford-place, London.

Lieut.-Col. M. E. McConaghey, D.S.O., Royal Scots Fusiliers, second son of the late Col. J. McConaghey, R.A.M.C.

THE HONOURS LIST.

The following award to a medical officer is announced :—

C.M.G.

Lt.-Col. Henry Arthur Powell, Australian A.M.C.

FOREIGN DECORATIONS.

By the President of the French Republic.

Legion d'Honneur.—Croix de Chevalier : Capt. V. B. Green-Armytage, I.M.S.; Lt.-Col. A. Mignault, Canadian A.M.C. *Croix d'Officier* : Col. H. D. Rowan, A.M.S.

Croix de Guerre.—Capt. A. C. Armstrong, Canadian A.M.C.; Temp. Capt. H. L. G. Hughes, D.S.O., R.A.M.C.; Temp. Capt. B. B. Noble, R.A.M.C.; Temp. Capt. R. R. Scott, R.A.M.C.; Temp. Capt. (temp. Maj.) A. G. Whitehorne-Cole, R.A.M.C.; Maj. H. H. Woollard, Australian A.M.C.; Temo. Lieut. St. J. D. Buxton, R.A.M.C.; Temp. Capt. K. G. Fraser, R.A.M.C.; Temp. Capt. W. A. L. H. Henderson, R.A.M.C.

THE PARIS CONFERENCE ON THE WAR CRIPPLE.

The proceedings of this inter-Allied conference opened on Tuesday with a *séance solennelle* at the Grand Palais, attended by the President of the French Republic. The delegates of the Allied Governments are as follows :—

Great Britain: Sir A. Keogh, G.C.B.; Fleet-Surgeon Percy H. Boyden, R.N.

Canada: Lieutenant-Colonel F. G. Finlay, C.A.M.C.

Italy: Professor Commandore E. Burci, Dr. Chevalier Guido Mendés.

Roumania: Dr. Marinesco.

Russia: M. le Chamtellan Bereznikow, Russian Red Cross; Professor Polienow.

Serbia: Colonel V. Soubotitch, Director-General Surgical Service of Serbian Army; M. Sava Ourotschevitch, Professor of University of Belgrade; M. Véllzar Jankovitch.

Besides the official delegates 700 unofficial delegates are attending the congress.

GLASGOW WAR RELIEF FUNDS.—A statement prepared by Mr. John S. Samuel, of the City Chambers, Glasgow, for the Lord Provost of that city shows that the amounts raised by various war relief funds from August, 1914, to December, 1916, total £2,550,199, or approximately £2 6*s.* per head of the population, a praiseworthy record.

WAR HOSPITALS IN THE EAST.—The officers' hospital in Busra has accommodation for about 50 officers, and is set apart for the nursing of acute cases only. The convalescent hospital at Beit Naama can take twice the number, and now possesses a launch, which every morning takes patients down from the hospital. Two of the Indian hospitals have an overflow barge-ward, which is much appreciated. Several English nursing sisters are now working in the Indian general hospitals.

The Indian Red Cross.—A branch of the Red Cross Society in Bombay has undertaken the important work of verifying the official reports of missing men by systematic inquiries covering the whole journey from the fighting line to the base depôts and hospitals, and from there to the invalid and convalescent camps in India.

OBITUARY OF THE WAR.

MICHAEL JOSEPH WHITTY, M.D., M.CH. R.U.I.,

LIEUTENANT-COLONEL, ROYAL ARMY MEDICAL CORPS.

Lieutenant-Colonel M. J. Whitty, who died a month ago at Liverpool, was 54 years of age. He studied at Queen's College, Cork, and the Catholic University, Dublin, obtaining his qualification in 1884. Two years later he joined the Royal Army Medical Corps, retiring in 1906 after 20 years' service, when he was enrolled in the Reserve of Officers. At the outbreak of war he was appointed medical inspector of recruits for the Western Command, and was mentioned in a recent *Gazette* for his strenuous work in this capacity. In Liverpool, where he lived for many years, he was known as a kind and genial man and an up-to-date medical officer.

WILLIAM BROWN CLARK, M.B., B.S. LOND.,

CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain W. B. Clark, who was recently killed in action in France, was younger son of Dr. G. B. Clark, ex-M.P. for Caithness-shire and Consul-General of the South African Republic. Educated at Lynton House and King's College Schools, he continued his medical studies at King's College Hospital, qualifying in 1903, when he obtained a house appointment at his hospital. He graduated M.B., B.S. Lond. two years later, going abroad to study neurology under Professor Edinger, at Frankfort. While there he contributed some articles on the origin of the cerebellum in animals to the *Journal of Anatomy and Physiology*. In 1907 he took charge of the Neurological Laboratory in King's College, carrying on experiments for Sir David Ferrier. It was his habit to practise during the winter at Villars (Switzerland) and Varenna (Italy), spending his summers in this country. When the war began he joined the Wounded Allies Relief Committee, proceeding to Antwerp, which place he left by the last steamer before its capitulation. He then went to Ostend and his report to the committee on the terrible condition of the Belgian wounded in that place was brought to the notice of the British Government, with the result that Captain Clark and his brother-in-law, Major W. A. Brend, filled the first transport of Belgian wounded at Ostend and brought it over to Dover. The difficulties of this task were graphically described by Major Brend in the *Nineteenth Century* of January, 1915.

Captain Clark joined the Royal Army Medical Corps in September, 1914, and held various appointments in hospitals, field and motor ambulances. At the time he was killed he was attached to a battalion of the Scots Guards. His chief wrote that though only a few months with the division, his sterling qualities and capabilities had proved a valuable asset to its medical staff. In 1906 Captain Clark married Ethel Vera, daughter of D. C. Howat, of Glasgow, and leaves a little daughter.

THOMAS GEORGE SMITH HODSON, M.D. DURH.,

CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain T. G. S. Hodson, who lost his life by the sinking of the hospital ship *Salta* on April 10th, at the age of 53, was a son of the late William Hodson, of Downhills, Middlesex. Educated privately, he studied medicine at the London Hospital, taking his M.B. Durh. in 1893, and his doctorate five years later. He then practised for a time at Buxton and Bitterne (Hants), where he held several public appointments before settling in London. In June, 1915, he joined the Royal Army Medical Corps and was for some time attached to the Royal Victoria Hospital, Netley, afterwards serving on the Recruiting Medical Board at Bristol. Returning to Netley, he answered the call for volunteers for transport work, and was attached to the *Carisbrooke Castle*. In April he was appointed to the *Salta*, on which he had only been four days when the vessel was sunk in the Channel. A medical friend, who knew Captain Hodson for 20 years, writes that he never heard him speak a harsh word of anyone. Captain Hodson married in 1906 Margaret Mary, daughter of the late Dr. Samuel Hyde, of Buxton, and leaves two daughters and one son.

HARRY GRAHAM SMITH, L.R.C.S. EDIN., L.D.S.,

CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain H. G. Smith, who lost his life by the sinking of the hospital ship *Salta* in the English Channel on April 10th, was a son of the late Dr. John Smith, F.R.S.E., a former President of the Royal College of Surgeons, Edinburgh. He was educated at Edinburgh Academy, obtaining his surgical qualification in 1883 and his dental three years later. He settled at Yealand Conyers, near Carnforth, where he became well known in the district. Always fond of a sea life, at the outbreak of the war he volunteered as surgeon on a transport, receiving a commission in August, 1915, when, after a few months on Salisbury Plain, he was appointed to the *Salta*. Captain Smith was a keen sportsman, shot, and angler, and loved an outdoor life. A medical friend writes of him as the best of companions and one who, owing to a wide experience gained by travelling in other countries, could give sound advice on many subjects.

M. R. HUGHES, M.B., B.S. MELB.,

CAPTAIN, AUSTRALIAN ARMY MEDICAL CORPS.

Captain M. R. Hughes, who was killed in France on March 20th last, was 25 years of age. He matriculated from Wesley College, Melbourne, entering Queen's College at the Melbourne University, where he graduated in medicine and surgery with honours in 1915, and qualified for appointment as one of the resident medical staff of the Melbourne Hospital. At the completion of his term at this hospital he joined the Australian Imperial Force. After his arrival in England he was transferred to France as

medical officer to an Australian infantry battalion, and was serving in this capacity when he was killed. His death will be deeply regretted by a large circle of friends amongst the younger members of the profession in Victoria.

BENJAMIN DIGBY GIBSON, L., L.M., D.P.H. R.C.P.S.I.,

CAPTAIN, AUSTRALIAN ARMY MEDICAL CORPS.

Captain B. D. Gibson, who died in Egypt on Jan. 14th whilst serving with the Anzac Mounted Division, was the only son of the late Henry Fisher Gibson, Deputy Registrar of the King's Bench, Dublin. He took his licentiateship in 1904 at the Royal Colleges of Surgeons and Physicians, Ireland, obtaining his Diploma in Public Health a few years later. He held various appointments, including that of house surgeon at the Royal City of Dublin Hospital and of resident medical officer at the Westmorland Hospital. Later he was assistant medical officer at the General Post Office and anæsthetist to the Dental Institute.

In 1914 he was in practice in the neighbourhood of Sydney, N.S.W., and on outbreak of hostilities was appointed to the Australian Army Medical Corps for home service, also acting as lecturer for the British Red Cross. A year later he was attached to a Light Horse Field Ambulance and was mentioned in the Katia-Romani despatch. He was subsequently transferred to another Light Horse Brigade and was recommended for honour by his commanding officer.

Captain Gibson was a freeman of Dublin and an active member of the Dublin Bay Sailing Club. He was unmarried.

GEOFFREY RATCLIFFE PLAISTER, M.R.C.S. ENG.,

CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain G. R. Plaister, who was killed in action on April 11th at the age of 35, was younger son of Dr. W. H. Plaister, of Tottenham. He was educated at the London Hospital, taking his Conjoint qualification in 1905, when he settled in practice at Tottenham, becoming joint secretary to the North-East London Clinical Society. When war broke out he served at first as chief inspector to the local special constabulary, then obtaining a commission and becoming attached as medical officer to the Yorks and Lancaster Regiment. After being for some time the only officer in the regiment to come through unscathed he was killed almost instantaneously by a machine-gun bullet.

In an appreciation from the Tottenham Medical Union, Captain Plaister is described as a gentle and large-hearted personality, whose unassuming exterior concealed much worldly and medical wisdom. The union was formed on his suggestion to link the medical practitioners of the district in fraternal bonds. He will be specially missed by the poor of Tottenham, to whom he was a true friend.

JOSEPH NAYLOR, M.R.C.S. ENG.,

LIEUTENANT, ROYAL ARMY MEDICAL CORPS.

Lieutenant Naylor, who was one of the medical staff on H.M.H.S. *Salta*, and reported missing, supposed drowned when the vessel was mined in the Channel on April 10th, was the son of the late Mr. Joseph Naylor, J.P., sometime mayor of Kidderminster. He took his medical course at St. Bartholomew's Hospital, qualifying in 1889, and after holding an appointment as house surgeon at the Derbyshire General Dispensary he settled in practice at Tipton (Staffs), where he remained for 22 years.

In October, 1916, he volunteered for service at home or abroad, and after a period at Sunderland he was given embarkation and hospital-train duty. He was appointed to H.M.H.S. *Asturias*, and afterwards to the *Salta*.

THE UNITED STATES AND MEDICAL ORGANISATION FOR THE WAR.

The Supply of Medical Men and their Equipment.—The Medical Board of the Council of National Defence suggests the earlier graduation of senior classes in the medical schools of the country, the holding of continuous sessions, and the elimination of the year's hospital service heretofore required before entrance into the Navy or Army. The standardisation of all surgical instruments is advocated to ensure the exclusive production of the instruments needed by the combatant services and the elimination of all unessential types of instruments. Comparing these suggestions with the problem of keeping up the supply of medical men as presented to the authorities in England, the *Journal of the American Medical Association* says :—

> A medical school is, in a sense, a factory, the output of which is absolutely essential to the maintenance of the armed forces in the field. ..... The problem with us is quite clear. Medical schools and civil hospitals must be kept in operation. ..... The national emergency demands that they coöperate in overcoming the present grave shortage of medical men. This can be accomplished by reducing the teaching staff to a minimum, working through vacations to increase the product, or by the Italian plan, which meets the needs both of the service and the future at the same time.

The Italian plan, it is explained, is to send clinical faculties with attached medical students to base hospitals at the front, where army service is performed by caring for the sick and wounded, while instruction is continued at the same time. Men are thus graduated automatically into the medical corps of the Army during the progress of the war. Certain medical schools in America are already organising on these lines.

In the State of New York one thousand health officers are reported ready to make a preliminary examination of recruits. A mobile laboratory unit has also been organised to provide a diagnostic service at any point where needed for the mobilisation of the troops. The New York State Department of Health has ordered large supplies of vaccines, and a drinking water outfit is being worked out to provide calcium hypochlorite in sufficient quantity to disinfect 50 gallons of water, with means for removing the taste due to excess of chlorine.

Women Doctors and National Service.—In the *New York Medical Record* Dr. Mary S. Macy discusses the available means of organisation for national service among medical women in the United States. Of the estimated 145,240 persons qualified to practise medicine in the United States probably 5518, or nearly 4 per cent., are medical women. They are most strongly represented in the special departments, gynæcology claiming 519, obstetrics 143, pædiatrics 129, and ophthalmology (alone, or with ear, nose, and throat)

125. A large proportion are skilled in subjects which may be said to embrace the laboratory and social service fields of medicine (Dr. Macy computes it at 34 per cent.); they are versed in clinical pathology, roentgenology, public health, or bacteriology, which should make them specially useful if required for active service at the front. The remaining medical women, numbering 4500 or more, should, she thinks, be able to carry on the civilian medical work in their own communities, releasing men better equipped than themselves for military service.

Treatment of Tuberculous Soldiers.—Dr. Hermann M. Biggs, chairman of the Commission appointed by the National Association for the Study and Prevention of Tuberculosis, will have associated with him as members Dr. George M. Kober and Dr. Charles J. Hatfield. The chief work of this Commission will be directed towards the detection of incipient cases among the recruits in the Navy and Army and the prevention of the development and spread of the disease in the military forces and in the internment camps.

The Shortage of Salvarsan.—The Council of the St. Louis Medical Society have passed a resolution urging the Government to take prompt action "in view of the fact that an efficient arsenic product would be available in the market were it not for the present dangerous and unwarranted patent laws in regard to this and similar therapeutic products."

BLINDED SAILORS AND SOLDIERS.

Newington House Scheme.—At a recent conference at St. Dunstan's Hostel for Blinded Soldiers it was agreed that Newington House Hostel, Edinburgh, should be affiliated with St. Dunstan's while retaining control of its own affairs. All blinded Scottish sailors and soldiers who reside, or intend to reside, in Scotland will receive their training at Newington House. The official register of sailors and soldiers who have been blinded in the war will be kept at St. Dunstan's, and all recommendations with regard to additional allowances, bonuses, and other benefits will be received by the Pensions Ministry from St. Dunstan's only, but the authorities at Newington House will have a copy of this register, in so far as it relates to Scottish soldiers, submitted to them periodically.

Bazaar in Aid of St. Dunstan's Hostel.—On May 7th Queen Alexandra, who opened at the Albert Hall, a bazaar organised in the interest of the work carried on at St. Dunstan's Hostel, thanked Sir Arthur Pearson for the work that he had done on behalf of the blind, adding that "nobody else could have accomplished it." Sir Arthur Pearson expressed the hope that the system of after-care which the bazaar was designed to benefit would smooth away the difficulties besetting the blind home-worker by providing him with raw material, supervising his work, marketing his goods, and assisting him in every way to overcome the handicap entailed by loss of sight. On succeeding days the bazaar was opened by Mrs. Lloyd George and the Lord Mayor of London.

RED CROSS THANKSGIVING.—On Thursday, May 17th, Ascension Day, the 3 o'clock service at Westminster Abbey will be devoted to thanksgiving for the beneficent work of the Red Cross. Application for tickets and all inquiries should be made to Mr. E. P. Vaughan-Morgan, Room 24, 83, Pall Mall, S.W.1. The north transept and nave of the Abbey will be open to the general public without tickets.

THE SERVICES.

ROYAL NAVAL MEDICAL SERVICE.

To be temporary Surgeons: E. S. Bowes, S. S. Barton, J. S. McGrath, and D. S. Stevenson.

ROYAL ARMY MEDICAL CORPS.

Lieut.-Col. H. W. Grattan to be temporary Colonel whilst employed as Assistant Director of Medical Services of a Division.

Lieut.-Col. Thomas H. J. C. Goodwin, C.M.G., D.S.O., to retain the acting rank of Colonel whilst employed as an Assistant Director of Medical Services at the War Office.

To be acting Lieutenant-Colonels: Temp. Capt. J. G. Johnston whilst commanding a Field Ambulance, Major N. Low, D.S.O., whilst commanding a Casualty Clearing Station.

Major A. W. Mayo Robson, C.V.O., C.B., R.A.M.C. (T.F.), to be temporary Lieutenant-Colonel.

The undermentioned are granted temporary rank whilst employed at the Sunderland War Hospital: As Lieutenant-Colonel: Lieut.-Col. J. W. Alexander, D.S.O., West Yorkshire Regiment (T.F.). As Majors: T. C. Squance, W. Robinson. As Captain: W. H. Maling.

To be temporary Majors: J. J. G. Blandford, Temp. Capt. L. B. Robertson, Canadian A.M.C., and Temp. Capt. J. F. Burgess, Canadian A.M.C.

Capt. C. W. Bowle relinquishes the acting rank of Lieutenant-Colonel on re-posting.

Temporary Lieutenants to be temporary Captains: R. L. Bell, W. R. H. Smith, G. A. Back, W. V. Pegler, H. W. Evans, H. Hendry, H. E. Whttttingham, J. Nunan, J. W. Tonks, L. R. F. P. Marshall, J. A. Fretton, G. E. Dodson, G. G. Old, H. Mohan, S. Macnaughton, S. C. W. Iredale, G. B. King, J. F. Nicholson, I. O'Keffe, D. Morrison, T. R. Hunter, W. Halliwell, J. A. H. Telfer, F. J. H. Begg, F. L. Keith, T. P. Hutchison, T. B Brandon, V. Wallace, C. J. McCarthy, J. T. Bleasdell, J. A. C. Roy, E. J. Dyke, H. B. Maxwell, S. Littlewood, W. B. Anderson, D. Ross, S. Robson, R. T. Taylor, A. E. Pinniger, W. Ward-Smith, J. P. Lowson, J. McF. Donnan, P. Milnes, R. A. Leembruggen, J. F. C. O'Meara, C. G. Skinner, A. M. Bayne, C. E. A. Frow, G. Stewart, L. B. W. Braine, E. C. A. Reynolds, R. A. McKay, J. E. O'Donnell, H. G. Joyce, J. C. Houston, C. W. Aikman, J. G. Ackland, W. R. White-Cooper, A. T. Edwards, A. C. Pickett, J. H. Lechler, F. E. Feilden, V. J. P. Clifford, W. S. Allan, W. H. W. C. Carden, S. H. L. Archer, C. Dundee, S. Pool, A. Beeley, A. H. Smith, C. Cameron, E. Hudson, A. A. Hill, A. D. Millington, J. V. Watson, A. C. Price, D. A. Chalmers, F. F. Carr-Harris, E. A. T. Green, L. L. McKeever, J. D. Wright, H. C. Davies, A. Ball, W. G. Shaw, G. J. McGorty, E. H. Shaw, L. Walton, T. D. Miller, R. C. B. Briscoe, F. R. Wilson, P. A. Rostant, J. Dickson, C. Harris, R. J. Arundel, J. P. Pegum, J. F. Penman, D. Corry, A. Wilson, A. Sunderland, K. M. Walker, J. F. Blackett, A. E. Gravelle, J. B. Wood, and G. E. Kinnersly.

Temp. Hon. Lieut. D. H. D. Cran to be temporary honorary Captain whilst serving with the Scottish Red Cross Society, and W. Martin to be temporary Honorary Captain while employed with the British Red Cross Hospital, Netley.

F. Packard to be temporary Honorary Lieutenant whilst serving with a General Hospital.

Officers relinquishing their commissions: Temp. Lieut.-Col. A. H. Burgess (Major, R.A.M.C., T.F.), having resigned his appointment; Temp. Lieut.-Col. F. D. Bird, C.B.; Temp. Capts. L. A. Walker, W. N. Rishworth, E. J. Eedle, F. L. Gill, W. T. Smith, W. A. Kennedy, H. R. Brown, J. L. Digby, C. Farronridge, W. P. Noall, J. N. Glaister, J. J. Crawford, A. H. Corley, A. D. Howard, R. Williams, C. A. Robinson, C. Butler, W. B. Lawrence, A. R. Rendle, W. J. Hill, J. W. Heekes, J. M. Twentyman, H. H. Clarke, H. M. Meyrick-Jones, A. P. Yonge, W. A. H. Birrell, D. T. Fraser, R. F. Jones (on account of ill-health), W. W. Scott, J. F. Steven, D.S.O. (on account of ill-health); Temp. Lieuts. J. E. Middlemiss (on account of ill-health), J. C. Buckley, D. R. Taylor, A. Whittome, E. Slack, H. B. Thomson, D. A. Crow, H. A. Macdonald, C. M. Radie, W. F. Cornwall, F. J. MacManus, R. A. Slater, R. S. Novis, W. H. Soady, R. C. Corbett, W. W. W. Watt, J. H. Harford, J. G. Ross, A. E. Harrison, H. L. Morrow, J. R. Hall, P. J. Murray, J. B. C. Maguire, D. J. Jackson, W. Patey, W. A. Steen, M. F. Taylor, A. F. Seacombe, A. H. Arnott, and H. C. Terry.

SPECIAL RESERVE OF OFFICERS.

Capt. R. Magill relinquishes the rank of acting Lieutenant-Colonel on re-posting.

F. G. L. Dawson (from University of London Contingent O.T.C.) and T. H. Rhys to be Lieutenants.

TERRITORIAL FORCE.

Major C. A. Lees to be acting Lieutenant-Colonel whilst holding the appointment of Administrator.

Capts. J. S. Manford and A. T. Mulhall to be acting Lieutenant-Colonel whilst commanding a Field Ambulance.

Capt. (temp. Major) T. H. Peyton to be acting Lieutenant-Colonel whilst commanding a Field Ambulance.

Capt. A. Rodger, from T.F. Res., to be Captain, with precedence as from August 14th, 1915.

Capt. T. W. Morcom-Harnels to be acting Major whilst in command of a Field Ambulance.

Capt. A. G. T. Fisher to take rank and precedence in the R.A.M.C., T.F., and in the Army as if his appointment as Captain bore date the 10th day of July, 1916.

Capt. (acting Lieut.-Col.) A. J. Evans relinquishes his acting rank on ceasing to command a Field Ambulance.

Surg.-Maj. F. W. Bailey, D.S.O., from R.F.A., to be Major, with precedence as from Dec. 12th, 1915.

To be Captain: Lieut. J. Rosencwige, Lieut. W. C. D. Maile.

A. W. W. Baker to be temporary Captain whilst serving with the O.T.C.

Major A. H. Burgess is restored to the establishment.

H. C. Sands to be Lieutenant.

Capt. (acting Major) T. H. Chittenden relinquishes his commission on account of ill-health, and is granted the honorary rank of Lieutenant-Colonel.

VOLUNTEER FORCE.

Suffolk Volunteer Regiment, 5th Battalion: A. Leeming (late Lieutenant, R.A.M.C.) to be temporary Captain.

INDIAN MEDICAL SERVICE.

Lieut.-Col. A. Miller to be Professor of Medical Jurisprudence, Medical College, Madras, in addition to his other duties.

The King has approved the promotion of the following officers:—

Majors to be Lieutenant-Colonels: C. A. Lane, T. B. Kelly, C. H. Watson, E. F. E. Baines, G. O. F. Sealy, J. G. P. Murray, Brevet Lieut.-Col. S. Anderson, F. H. G. Hutchinson, J. L. Marjoribanks, A. Fenton, R. W. Knox, D.S.O.

Captains to be Majors: A. F. Hamilton, A. D. White, A. A. McNeight, N. M. Wilson, J. S. O'Neill, W. S. Nealor.

Lieutenants to be Captains: G. H. Mahony, G. Covell, W. R. Stewart, Kotyvenkata Ramna Rao, J. G. O. Moses, Hari Chand, Venkatasubba Mahadevan, A. C. L. O'S. Bilderbeck, J. W. Van-Reenen, B. F. Beatson, M. J. Roche, N. Das Puri, Prabodh Chandra Roy, Monindranath Das, Jagannath Balkrishna Vaidya, J. M. R. Hennessy, A. G. Cowper, W. M. Lupton, H. H. Brown, C. H. N. Baker.

The King has also approved the grant of the temporary rank of Lieutenant to Noormahomed Kasembhai Chohan, and the relinquishment of temporary Lieutenant by Kaikhusro Kersaspji Dadachnji.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Venereal Disease Bill.

THE Venereal Disease Bill has been passed by a Standing Committee of the House of Commons, but its form has been greatly altered.

On Thursday, May 3rd, the Committee resumed the consideration of Clause 1, which provides for the prevention of the treatment of venereal disease or the supply of remedies therefor otherwise than by duly qualified persons. The first subsection had been disposed of at the previous sitting.

Mr. GLYN-JONES moved as an amendment the insertion of a new subsection in the following terms:—

No qualified medical practitioner shall supply to any patient any remedy for the treatment of a venereal disease except in areas in which for the time being a medical practitioner is permitted to supply drugs or medicines to insured persons under the National Insurance Acts or in cases where the practitioner himself administers the remedy to the patient. Provided that nothing in this subsection shall interfere with the supply of remedies by any institution or hospital approved by the Local Government Board for the treatment of venereal disease to patients attending such institution or hospital.

The honourable Member said that the effect of the Bill as it stood would be that medical men would be protected, not only in their proper function of diagnosing and prescribing for venereal diseases, but they would be able to take over the dispensing of medicines as far as they desired. The medical man would require the pharmacist to send his (the pharmacist's) customers to him. The separate functions of the medical man and the pharmacist were recognised at the time when the Insurance Act was passed. All that he asked the Committee to say was that the doctor should do his proper work and receive his proper fee, and that the pharmacist should supply the drugs, not on his own initiative but because they were prescribed by a medical man.

Sir P. MAGNUS, in opposing the amendment, failed to see any valid reason for altering the law as it now existed regarding the legal right of members of the medical profession to supply drugs in certain cases. The honourable Member talked about interfering with the rights of the chemist in supplying medicines. The Bill did nothing of the sort. All that it interfered with was the right to supply medicines for these specific diseases without a prescription. If he got the prescription he could supply the remedy. The amendment proposed to take away from the medical practitioner a right now given him by law. But the Committee had to look at this question from the wider point of view of public health and not from the pecuniary point of view of any profession. The Committee had to remember that persons suffering from these diseases were anxious that the fact should be known to as few as possible. The medical man was under a moral obligation not to allow what had been communicated to him as a medical man to be known, and in order to maintain the relation of confidence he should not be prevented from supplying the medicine to the patient.

Mr. HAYES FISHER (Parliamentary Secretary to the Local Government Board) said that the honourable Member (Mr. Glyn-Jones) was inviting the Committee to enter on the old battle, that doctors only should prescribe and chemists only should dispense. He hoped that the Committee would not be led aside by that. Medical men now had the power to dispense, and if the amendment was adopted it would be taken away from them so far as venereal diseases were concerned. He did not think that the Committee should do anything by this Bill to take that right away. He thought that medical men and chemists were both going to lose pecuniarily by the Bill and by the new policy of which it was a part, but the community would benefit. As the clinics for free treatment, of which the State bore 75 per cent. of the expenditure came into existence, and as people resorted to them, medical men would lose part of their private work. Chemists would lose something also, but he thought the medical men might lose more than the chemists. Just as the Sabbath was made for man and not man for the Sabbath, so doctors and chemists were made for the community and not the community for doctors and chemists. He thought the Committee should reject the amendment.

After some discussion the amendment was rejected by 22 votes to 8.

The Committee then proceeded to rearrange and redraft the remaining clauses of the Bill.

A second subsection was added to Clause 1 in the following terms:—

This section shall operate in any area to which it is applied by order of the Local Government Board or in Scotland and Ireland the Local Government Board for Scotland and Ireland respectively. Provided that no order shall be made in respect of any area until a scheme for the gratuitous treatment of persons in that area suffering from venereal disease has been approved by the Local Government Board or, in Scotland and Ireland, the Local Government Board for Scotland and Ireland respectively, and is already in operation.

Emphasis was placed by several members of the Committee on the desirability of having gratuitous treatment in operation before an order was made in regard to any area.

The other subsections of Clause 1 were cut out and the clause as amended was agreed to.

On the motion of Mr. GLYN-JONES, the following new clause was inserted in the Bill:—

A person shall not by any advertisement or any public notice or announcement offer to treat any person for venereal disease, or to prescribe any remedy therefor, or to give any advice in connexion with the treatment thereof.

A person shall not hold out or recommend to the public by any public notice or advertisement, or by any written or printed papers or handbills, or by any label or words written or printed affixed to or delivered with any packet, box, bottle, phial, or other enclosure containing the same, any pills, capsules, powders, lozenges, tinctures, potions, cordials, electuaries, plaisters, unguents, salves, ointments, drops, lotions, oils, spirits, medicated herbs and waters, chemical and officinal preparations, whatsoever to be used or applied externally or internally as medicines or medicaments for the prevention, cure, or relief of any venereal disease.

Provided that nothing in this section shall apply to any advertisement, notification, announcement, recommendation, or holding out made or published with the sanction of the Local Government Board, or to any publication sent only to duly qualified practitioners and/or to wholesale or retail chemists for the purposes of their business.

Another new clause was inserted in the Bill reproducing the terms of Subsection 3 of Clause I. of the original Bill in the following terms:—

If any person acts in contravention of any of the provisions of this Act he shall be liable on conviction on indictment to imprisonment, with or without hard labour, for a term not exceeding two years, or on summary conviction to a fine not exceeding one hundred pounds, or to imprisonment with or without hard labour for a term not exceeding six months.

A definition clause was agreed to as follows:—

In this Act the expression "venereal disease" means syphilis, gonorrhœa, or soft chancre.

The Bill as amended was ordered to be reported to the House.

Highlands and Islands Medical Service Board.

The report of this Board for the year 1916, now presented to Parliament and issued as a White Paper, shows that owing to war conditions the Board have not been able to give full effect to their various intentions. The needs of some of the more necessitous districts have been met as far as circumstances permitted, but in many districts no progress has been possible. The rest of the Board's schemes, and particularly those providing for capital expenditure, are practically in abeyance for the period of the war. The greater part of the work for which the Board was called into existence still remains to be done. Considerable progress has been made with the introduction of a medical service at modified fees to certain classes of the community, but the scheme is still incomplete, and the Board have not yet had sufficient experience of its working to enable them to determine whether, and, if so, to what extent, it may call for modification. For the present it applies to the crofter and cottar classes and their families and dependents, and others in like circumstances, to whom the payment of the practitioner's ordinary fee for medical attendance would be an undue burden. The fees chargeable to such persons will not exceed 5*s.* for the first visit and 2*s.* 6*d.* for each subsequent visit in the same illness. The maximum fee in midwifery cases has been fixed at £1. The estimated expenditure under the scheme for 1916, £20,000, has been exceeded by £500. The estimate for 1917 has been fixed at £22,000. A beginning only has been made with the organisation of nursing, but reference is made to the question of efficient nursing in connexion with maternity and child welfare schemes which, together with the Notification of Births (Extension) Act, 1915, and the Midwives (Scotland) Act, 1915, make necessary a unification of the nursing service if overlapping is to be avoided and economy in administration secured. The policy of the Board with regard to nursing in large areas is exemplified in the arrangements made for the Island of Lewis, the district committee being charged with the administration of both the last-mentioned Acts, while they also undertake the management of the general nursing service. It is provided that district nurses subsidised by the Board will be in the employment of the district committee, and their appointment and dismissal will be in the hands of the committee, subject to the approval of the Board. The report concludes with an expression of indebtedness to the Education Department of the Local Government Board for Scotland for permitting their officers to take part in the work of organising the Board's schemes, and to the Naval authorities for their kindness in arranging for the conveyance of doctors, nurses, and medical stores to and from outlying islands where the ordinary means of communication are at present in abeyance.

Billeting of Civilians and Infectious Disease.

As the result of representations during debates in the House of Commons on the Billeting of Civilians Bill a clause was introduced into the Bill to permit occupiers of premises in which persons were billeted under the measure to receive compensation for the loss or damage caused by the introduction of infectious disease.

HOUSE OF COMMONS.

WEDNESDAY, MAY 2ND.

Medical Classification in the Army.

Answering Mr. HOGGE, Mr. MACPHERSON (Under Secretary for War) said: It is not necessarily the existence of a disability but the degree of disability which determines a man's classification. Thus, varicose veins, if exceptionally severe, might lead to a man being rejected; if less severe, to his being placed in category C 3 or C 2, and so on. Their mere existence would not debar a man from being placed in category A. This might be quite unimportant. Each case must be judged by the medical man before whom the case comes on its own merits.

Medical Re-examinations.

Mr. G. LAMBERT asked the Under Secretary for War whether a man medically discharged from the Army and called up again under the recent Act had the right of appeal from the decision of the Army medical authorities.—Mr. MACPHERSON replied: A man called up and examined by a recruiting medical board under the Military Service (Review of Exceptions) Act, 1917, has no right of appeal against his medical classification by the board. Each man, however, to whom the notice requiring him to be medically examined is sent under the Act, has the right of application to a tribunal within 30 days from the sending of the notice for exemption from military service on any grounds set out in the Military Service Act, 1916, Section 2 (1), including the ground of ill-health or infirmity.

Mr. LAMBERT: Would a certificate from a man's own medical adviser be accepted?—Mr. MACPHERSON: I said in the course of the debate on the Act that due regard would be given to any certificate from a family practitioner.

Malarial Cases in the Army.

Mr. COWAN asked the Under Secretary for War whether the cases of malaria among officers and rank and file, now in England, were being generally treated by medical practitioners without special experience of that disease, which had resulted in a loss of man power to the Army by the prolongation of the treatment; and whether all malaria cases would now be put through a short but stringent course of treatment for the purpose of eradicating their infections immediately and allowing of their early return to duty.—Mr. MACPHERSON answered: Centres for the treatment of malaria have been established in each Command, and officers with experience of this disease have been placed in charge of them. Malarial cases are now being put through a course of treatment with the hope of eradicating the disease.

MONDAY, MAY 7TH.

Medical Men and Research Work.

Sir J. D. REES asked the Under Secretary for War whether, in calling up members of the medical profession, members whose research work was by common consent of public value would be included amongst the number of those who remained in the United Kingdom.—Mr. MACPHERSON replied: The decision as to the individuals to be called up has been delegated to the professional tribunals set up under the Military Service Act, and the point which my honourable friend has in mind will be for their consideration.

TUESDAY, MAY 8TH.

Medical Officers and Administrative Work.

Answering Major CHAPPLE, Mr. MACPHERSON (Under Secretary for War) said: The number of medical officers solely occupied with non-professional work in hospitals is negligible. The administrative duties are so bound up with professional knowledge and experience that no saving in medical officers would result from increasing the number of non-medical officers now employed.

Artificial Limbs.

In reply to Major CHAPPLE, who asked a question in regard to the supply of artificial limbs, Mr. BARNES (Minister of Pensions) said: To give satisfaction to the patient and to secure lasting qualities an artificial limb must be of the very best materials and workmanship and very carefully fitted to the person for whom it is made. I am advised that in these circumstances satisfactory limbs cannot be produced at so low a cost as £5, and I do not think that any advantage would be gained by bringing another department into the procedure of their supply.

Major CHAPPLE asked whether, in the case of a limbless officer, a sum of £25 is given him with which to buy an artificial limb; whether, in some cases at least, such an officer had had to pay £40; whether these limbs could be made for something over £5; and whether, in the interest of wounded soldiers as well as in the interest of economy, the right honourable gentleman intended to take any steps in the matter.—Mr. BARNES answered: It is not the case that a limbless officer is given a lump sum irrespective of the nature of the limb required. In Army Council Instruction No. 786 of 1916 a scale of prices is fixed for the various types of limb varying from £10 10*s.* for a Syme's amputation to £29 8*s.* for an ordinary leg with pelvic band and to £40 for an arm of a complex type for use in special cases, and the officer is given the price allowed by the scale for the type of limb required. No change is at present contemplated in this arrangement except such as may be occasioned by improvement of the type and by reduction in price due to competition.

Medical News.

A NEW wing of the Royal Naval Hospital at Haslar, the gift of the women of Canada, was formally opened by the Queen on Wednesday. Surgeon-General Sir A. W. May, Director-General of the Naval Medical Service, stated that £40,000 had been raised for the purpose, the hospital extension having taken the place of the hospital ship at first suggested, in order to give permanent expression to the Canadian women's generous gift.

MORTALITY AMONGST WOMEN IN CALCUTTA.—The excessive mortality amongst women and children in Calcutta is the subject of strong comment in the departmental report of the municipal health officer. The death-rate is 50 per cent. higher amongst women than amongst men, an evil, as the health officer points out, largely due to the observance of the purdah system in insanitary environments. This system, he suggests, would probably not be productive of much harm in garden houses with spacious compounds, but in the slums of a city it is fatal, involving the constant exposure of the women to insanitary surroundings, and creating grossly insanitary conditions. In a congested city it is difficult to secure privacy without sacrificing fresh air, the zenana is in consequence situated at the back of the house and inadequately lighted and ventilated. While the man who resides amid insanitary surroundings is usually away from home for the greater part of the day there is no such escape for the purdah woman. The terrible results are indicated by the fact that while the actual male death-rate in 1915 was 24·1 per 1000, the female rate was 37·8 per 1000.

LONDON AND COUNTIES MEDICAL PROTECTION SOCIETY, LIMITED.—The annual meeting of this society will be held on Wednesday next, May 16th, at 32, Craven-street, Strand, W.C. 2, at 4 P.M., when the annual report for the year 1916 will be presented. The report gives the gratifying information that the work for the year has been little affected by the war. The membership of the society has remained almost stationary, decrease in one class of cases being counterbalanced by increase in another. The income and expenditure account shows a balance carried forward of £1783 18*s.*

HOSPITAL AND HOME FOR SICK CHILDREN, LOWER SYDENHAM.—The annual report and statement of accounts for the year 1916 shows that this institution has suffered financially owing to the war. Largely owing to the increased cost of food a debt of £800 by way of loan has been incurred, to meet which stock must be realised at great sacrifice. The in-patient cases admitted during the year were 316, the out-patient attendances 3864 and the casualty cases 2411. Much good work was done in the eye and throat department, where children sent in by the London County Council are treated.

ASYLUM WORKERS' ASSOCIATION.—The annual general meeting of this association will be held at the Mansion House, London, on Monday next, May 14th, at 3 P.M., when the Lord Mayor, vice-president, will preside. The following, amongst others, are expected to take part in the proceedings: Sir John Jardine, President; Dr. David Nicolson, Sir William J. Collins, Sir James Crichton-Browne, Hon. Major Sir Robert Armstrong-Jones, Sir George H. Savage, Sir Frederick Needham, Dr. C. Hubert Bond, and Lieutenant-Colonel Thomson.

ROYAL EDINBURGH HOSPITAL FOR SICK CHILDREN.—At the annual meeting held on April 25th it was stated that while the price of food, coal, light, and medical dressings required in the hospital had gone up, the expenditure on the whole had gone down. The total surgical and medical attendances for the year numbered 26,842. On the medical side the work had been carried out by Dr. A. S. Cumming, Dr. R. Thin, and Dr. C. Mowbray Pearson. In the absence from the hospital on war duty of Mr. Stiles and Mr. Fraser, Mr. A. P. Mitchell had been in full charge of all surgical work.

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.

COLLIE, Sir JOHN, M.D., has been appointed a Physician to the Hospital for Epilepsy and Paralysis and other Diseases of the Nervous System, Maida Vale, W.

COMYN, HAROLD F., M.B., B.C.Cantab., M.R.C.S., L.R.C.P. Lond., Officer in Charge of Tuberculosis Department, Great Northern Central Hospital.

FORTY, DANIEL HERBERT, L.R.C.P. Lond., M.R.C.S., Medical Officer and Public Vaccinator for the Charfield District of the Thornbury (Gloucestershire) Union.

HANCOCK, J. E., M.R.C.S., L.R.C.P. Lond., Certifying Surgeon under the Factory and Workshop Acts for the Robertsbridge District of the County of Sussex.

MACKEOWN, W. J., M.B., B.S. R.U.I., Certifying Surgeon under the Factory and Workshop Acts for the Bishop's Waltham District of the County of Hants.

MEADEN, CHARLES, M.D., B.S. Durh., Acting Medical Officer for the Braunton District of the Barnstaple (Devon) Union.

RIVERS, CHARLES HENRY, Medical Officer of Health for the Redruth (Cornwall) Rural District.

TRAILL, A., Acting District Medical Officer for the Barnstaple (Devon) Board of Guardians.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).
When the application of a Belgian medical man would be considered the advertisers are requested to communicate with the Editor.

APPLECROSS, Ross-shire.—Medical Officer and Public Vaccinator. Salary £320 per annum.

BARNSLEY AND WAKEFIELD JOINT SANATORIUM COMMITTEE.—Resident Assistant Tuberculosis Officer and Resident Medical Officer at Mount Vernon Sanatorium. Salary £300 per annum, with board, &c.

BIRMINGHAM GENERAL DISPENSARY.—Resident Medical Officer, unmarried. Salary £300 per annum, with apartments, &c.

BOLINGBROKE HOSPITAL, Wandsworth Common, S.W.—House Surgeon. Salary £150 per annum, with board, &c.

BOLTON INFIRMARY AND DISPENSARY.—Second House Surgeon. Salary £200 per annum, with board, &c.

BRISTOL ROYAL INFIRMARY.—House Physician and House Surgeon. Salary at rate of £120 per annum, with board, &c.

BURNLEY, VICTORIA HOSPITAL.—House Surgeon. Salary £160 per annum, with board, &c.

BURSLEM, HAYWOOD HOSPITAL.—Female Resident Medical Officer. Salary £200 per annum, with board, &c.

CARDIFF, KING EDWARD VII.'s HOSPITAL.—House Surgeon for six months. Salary at rate of £175 per annum, with board, &c.

CHESTERFIELD AND NORTH DERBYSHIRE HOSPITAL.—House Surgeon. Salary £200 per annum, with board, &c.

DERBY, DERBYSHIRE ROYAL INFIRMARY.—Two House Surgeons. Salary £200 per annum, with board, &c.

DERBYSHIRE COUNTY COUNCIL.—Temporary Medical Superintendent for County Sanatorium and Tuberculosis Officer. Salary £500 per annum.

DEVONPORT, ROYAL ALBERT HOSPITAL.—House Surgeon, unmarried. Salary £150 per annum, with board, &c.

EVELINA HOSPITAL FOR CHILDREN, Southwark, S.E.—House Physician for four months. Salary at rate of £160 per annum, with board, &c.

GLOUCESTERSHIRE ROYAL INFIRMARY AND EYE INSTITUTION.—Senior House Surgeon. Salary £150 per annum, with board, &c.

HOLLAND (LINCOLNSHIRE) COUNTY COUNCIL.—Temporary County Medical Officer of Health and Temporary School Medical Officer. Salary £450 per annum.

HULL, VICTORIA HOSPITAL FOR SICK CHILDREN.—House Surgeon.

IPSWICH, EAST SUFFOLK AND IPSWICH HOSPITAL.—Two Female Resident Officers.

ITALIAN HOSPITAL, Queen-square, London, W.C.1.—House Surgeon for six months. Salary £80 per annum, with board, &c.

KENSINGTON BOARD OF GUARDIANS.—Resident Assistant Medical Officer Locum Tenens for Marloes-road Institution. Salary 7 guineas per week, with board, &c.

LEEDS PUBLIC DISPENSARY.—Resident Medical Officer. Salary £200 per annum, with board, &c.

LINCOLN, CITY OF.—Temporary Assistant Medical Officer of Health. Salary at rate of £300 per annum.

MANCHESTER, HULME DISPENSARY, Dale-street, Stretford road.—House Surgeon. Salary £250 per annum, with apartments, &c.

NOTTINGHAM CHILDREN'S HOSPITAL.—Female House Surgeon. Salary at rate of £200 per annum, with board, &c.

PAISLEY PAROCHIAL HOSPITAL, LUNATIC WARDS, AND POORHOUSE, Craw-road.—Resident House Surgeon. Salary £260 per annum, with board, &c.

PLAISTOW FEVER HOSPITAL, London, E.—Temporary Female Resident Medical Officer. Salary at rate of £300 per annum, all found.

QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford.—Casualty Officer.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—Election of Professors and Lecturers.

ROYAL FREE HOSPITAL, Gray's Inn-road, W.C.—Senior Resident Medical Officer. Salary £200 per annum. Also House Physician. Salary £50 per annum, with board, &c.

ST. GEORGE'S HOSPITAL, S.W.1.—Temporary Assistant Surgeon for six months.

ST. HELENS COUNTY BOROUGH.—Temporary Assistant Medical Officer of Health. Salary £350 per annum.

ST. PETER'S HOSPITAL FOR STONE, &c., Henrietta-street, Covent Garden, W.C.—Senior and Junior House Surgeons for six months. Salaries at rate of £75 per annum, with board, &c.

SHEFFIELD ROYAL INFIRMARY.—House Physician. Salary £120 per annum, with board, &c.

SURREY EDUCATION COMMITTEE.—Temporary School Dentist. Salary £300 per annum.

UNIVERSITY COLLEGE HOSPITAL.—Casualty Surgical Officer. Salary £100 per annum, with lunch. Also Assistant in Dermatological Department and Part-time Assistant in Venereal Diseases Department. Salary £200 per annum, with lunch.

WARWICKSHIRE AND COVENTRY JOINT COMMITTEE FOR TUBERCULOSIS.—Temporary Tuberculosis Officer. Salary £500 per annum.

WELLS ASYLUM, Somerset.—Temporary Assistant Medical Officer. Salary £300 per annum, with board, &c.

WORCESTERSHIRE, KING EDWARD VII. MEMORIAL SANATORIUM, Knightwick, near Worcester.—Temporary Medical Superintendent and Tuberculosis Officer. Salary £450 per annum, with board, &c.

THE Chief Inspector of Factories, Home Office, London, S.W., gives notice of vacancies for Certifying Surgeons under the Factory and Workshop Acts at Grosmont (Yorks) and at Tipton (Stafford).

Births, Marriages, and Deaths.

BIRTHS.

BATTY SHAW.—On May 6th, Muriel, wife of Dr. Batty Shaw, F.R.C.P., of a daughter.

BELL.—On May 1st, at Knaresborough-place, S.W., the wife of Major F. C. Bell, C.A.M.C., of a son.

HILTON.—On May 6th, at The Corner House, Northwood, the wife of O. Hilton, M.D., of a daughter.

MAWHOOD.—On May 4th, at Chalcots, Ascot, the wife of R. H. Mawhood, M.B., B.C.Cantab., F.R.C.S. Eng., of a son.

VERCOE.—On April 29th, at Old Court, Ealing, the wife of Richard H. Vercoe, M.R.C.S., L.R.C.P., of Southall, of a daughter.

MARRIAGES.

CROSS—WEAVER.—On April 23rd, quietly, in London, Leopold Harold Cross, L.D.S. Eng., Captain, R.A.M.C., to Clarice Blanche, daughter of the late John Weaver and Mrs. Weaver, of Streatham.

DRAKE-BROCKMAN—PILKINGTON.—On May 7th, at St. Botolph's Church, West Worthing, Lieutenant-Colonel Ralph E. Drake-Brockman, R.A.M.C., to Helen Maud, second daughter of Major Sir H. Pilkington, K.C.B., R.E. (retired), and Lady Pilkington, of Studland House, Worthing.

GRAY—COOPER.—On April 26th, at St. John's, Red Lion-square, Archibald Montague Henry Gray, M.D., Major, R.A.M.C., T.F., of 30, New Cavendish-street, W., only son of the late Dr. F. A. Gray, of Ottery St. Mary, Devon, to Elsie, youngest daughter of the late F. B. Cooper, of Newcastle, Staffs.

PICKLES—TUNSTILL.—On May 5th, at St. Andrew's Church, Aysgarth, Yorkshire, by the Rev. W. K. Wyley, M.A., vicar of the parish, Surgeon William Norman Pickles, M.B., M.S. Lond., R.N.V.R., son of Dr. J. J. Pickles, of Leeds, to Gertrude Adelaide, daughter of Harry Tunstill, of Thornton Lodge, Aysgarth, and of Rivington, Pendleton, Manchester.

DEATHS.

ADENEY.—On May 2nd, at Haward Lodge, Tunbridge Wells, Edwin Leonard Adeney, M.D., J.P., aged 58 years.

COALBANK.—On Saturday, May 5th, at Teddington Lodge, Teddington, Isaac Coalbank, M.R.C.S. Eng., L.S.A., M.D. Paris, aged 73 years.

DOUDNEY.—On April 29th, at Kombe, Northern Nigeria, of malaria, Dr. Leslie Doudney, W.A.M.S., aged 38 years.

FOWKE.—On April 27th, at Byfield, Northamptonshire, Frederick William Fowke, M.R.C.S. Eng., M.R.C.P. Edin., L.S.A. Lond., aged 73 years.

FOX.—Missing, believed drowned, on April 15th, Lieutenant-Colonel A. C. Fox, D.S.O., R.A.M.C.

KERR.—On April 26th, in San Francisco, William Watt Kerr, M.D. Edin., aged 59 years.

LONES.—Killed in action, on April 28th, Captain Percy East Lones, R.A.M.C., aged 30 years.

NASON.—On April 29th, at "Arbury," Stratford-on-Avon, John James Nason, M.B., J.P., aged 84 years.

SQUIRE.—On May 2nd, at his residence, Bentinck-terrace, North-gate, Regent's Park, N.W., after three days' illness, John Edward Squire, C.B., M.D., F.R.C.P., aged 61 years.

SYMONS.—Killed in action, on April 30th, Lieutenant-Colonel (acting Colonel) Frank A. Symons, C.M.G., D.S.O., Assistant Director of Medical Service.

TACKABERRY.—On March 25th, at a Stationary Hospital abroad, Captain John Bailey Tackaberry, I.M.S., aged 34 years.

TURNER.—On May 2nd, at Clifton, George Browne Turner, M.D., J.P., of Camden House, Hemel Hempstead, in his 91st year.

WILLIAMS.—Died May 4th, 1917, at Guilsborough, Northants, Henry William Williams, M.D., aged 81, eldest son of the late William Williams, surgeon, of Guilsborough, Northants.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

THE following promotions and appointments to the Order of the Hospital of St. John of Jerusalem in England have been made: Major Sir Edward Scott Worthington, C.M.G., M.V.O., and Lieutenant-Colonel Frank Warburton Begbie, R.A.M.C., to be Knights of Grace, and Surgeon Lieutenant-Colonel James Stuart Brooke, V.D., to be an Esquire.

Notes, Short Comments, and Answers to Correspondents.

MICROSCOPIC STAINING WITH COPYING-INK PENCIL.

AT a recent meeting of the Zurich Medical Society, Dr. Louis E. Merian called attention to the convenience of using coloured pencils in staining microscopical preparations. The idea was suggested to him by a paper of Dr. E. Friedberger in the Military Supplement of the *Münch. med. Wochenschr.* of Nov. 21st last. Friedberger has invented a universal pencil for staining pus and blood films as well as gonococci, trypanosomes, spirochætes, and malaria parasites, and he proposes to bring out a Giemsa and a carbol-fuchsin pencil after the war. The method of staining suggested was very simple. After fixing, a drop or two of water was placed on the slide, and the coloured pencil rubbed in the water until the required depth of colour was attained. The preparation was then rinsed and dried in the usual way. It occurred to Dr. Merian that the ordinary indelible pencil obtainable for 1*d.* (they now cost 4*d.*) might serve the same purpose. The result proved satisfactory for white and red blood corpuscles, gonococci, and spirochætes. Of the various makes of indelible pencil obtainable in Switzerland Dr. Merian found "A. W. Faber Radium 5800" the most suitable, while Faber's "Castell," Hardmuth's "Mephisto 73 B. middle," and Rehbach's "Defregger" were also good. Dr. Merian claims a special handiness and cleanliness for this method as well as the convenience of carrying the pencil anywhere in the pocket. The stain keeps indefinitely and does not deteriorate as stains do in solution.

We have used this method in emergency, finding it to work well for pus, blood, and cultures. The drop of water should be placed by the side of the film, the indelible pencil rubbed well into it, and the coloured drop then led over the preparation.

THE SPARROW.

IT is officially explained that the sparrow whose destruction the Board of Agriculture urged is the house-sparrow, not the hedge-sparrow, "which is an eminently useful bird, to be encouraged by all possible means."

Some useful information with reference to this bird will be found in a small book published in 1899 by Vinton and Co., entitled "The House Sparrow: The Avian Rat," by William Bernhard Tegetmeier, F.Z.S., with an appendix by Eleanor A. Ormerod, F.E.S., of the University of Edinburgh. In his preface Mr. Tegetmeier said:—

> It is a remarkable fact that there is not one eminent, practical ornithologist of the present day in England or elsewhere who advocates the protection of this species. Many of those in the very first rank of science, and with the greatest experience of country life and knowledge of practical ornithology, who advocated the claims of this bird to protection in their youth, have, as the result of further experience and careful observation, been led to denounce it.

The tree-sparrow (*Passer montanus*) is smaller than the house-sparrow (*Passer domesticus*) and has a black patch in the middle of the white feathers on each side of the neck. There are also two distinct bands of white across the wing in place of one as in the ordinary sparrow. The so-called hedge-sparrow, or Dunnock (*Accentor modularis*), is wrongly named, says Mr. Tegetmeier:—

> It is a purely insect-eating bird, and neither in its structure, habits or food, is it closely related to the house-sparrow. It does not occur in large numbers and is highly beneficial as an insect destroyer.

An American report of 400 pages by the eminent ornithologist, Dr. C. H. Merriam, related the destruction effected by the sparrow in the United States. Particulars of wicker, wire, and other sparrow traps are given. In some parts of the country an arrangement of four ordinary bricks with short pieces of stick is used.

The food of sparrows for May to August is given as follows:—

> May.—Customary food: Corn; vegetable matter; seeds. Occasional food: Young pea-pods and leaves of peas; gooseberry blossoms and young gooseberries; small beetles; caterpillars of the brimstone moth and white cabbage butterflies; turnip seed; hay seed; sprouts of young barley half an inch long; pollen of the sycamore and apple; mangold leaves.
>
> June.—Customary food: Corn; vegetable matter; seeds of various sorts; peas. Occasional food: Gooseberries and other fruit; lettuces; small beetles; mangold leaves.
>
> July.—Customary food: Young wheat, barley, and oats; vegetable matter; seeds of various weeds. Occasional food: Peas; small beetles; beans; seeds of wild spinach.
>
> August.—Customary food: Wheat, barley, oats. Occasional food: Seeds of corn, bindweed, knotgrass, &c.; aphides, small beetles, daddy longlegs (*Tipula*), caterpillars of *Teras Contaminana*, moth of *Cramibus culmellus*.

It is well known that sparrows when taken in large numbers may be advantageously utilised as food.

A METHOD OF PRESERVING EGGS.

M. André, of Arnoux, recently described before a Paris medical society a practical means of preserving eggs for several weeks, allowing of their safe transport to the troops and to prisoners. The method consists in covering the egg with a hard envelope which prevents the penetration of the air. The new-laid egg is wrapped round with material steeped in liquid sodium silicate, so-called mineral glue, and then left to dry in an airy place for about twelve hours. At the end of this time the jacketed egg is of the consistency of a stone and entirely resistant to shock. When required for consumption it suffices to steep the egg in tepid water in which the mineral glue readily dissolves, or the silicated envelope may be cut off with a knife in the same way as fruit is peeled. 520 eggs which travelled for a month under the most exacting conditions arrived intact and in an excellent state of preservation.

HEALTH AND SANITATION IN NIGERIA.

FROM the medical section of the delayed report of Sir F. D. Lugard, Governor-General, on the Blue-book of Nigeria for the year 1915, just issued by the Colonial Office, it appears that the native population of the Northern Provinces is roughly estimated at 9,500,000 and that of the Southern Provinces at 7,805,000—a total of about 17,500,000. The average density in the Northern Provinces is about 37 to the square mile and in the Southern Provinces about 106. In the Northern Provinces at the end of 1915 there were about 700 Europeans, of whom some 300 were officials, and in the Southern Provinces about 2000 Europeans, of whom 800 were officials.

The general health of the colony was normal during the year. Compulsory registration of births and deaths only obtains in Lagos and Ebute Metta, and even in these places statistics are unreliable. The most prevalent general diseases are rheumatism and anæmia. Malaria is the commonest insect-borne disease, but small outbreaks of yellow fever have occurred on four occasions at different places in the Southern Provinces amongst the native population only, and one European contracted this disease in the Northern Provinces. A mild form of sleeping sickness is endemic in certain parts of the Niger Delta; the same disease is also found along the banks of the River Benue. Blackwater fever has shown a steady decline since 1910—this follows very closely the malarial fever curve. Considering the largely increased European population the decline of malaria and blackwater fever is significant. Cases of pulmonary tuberculosis were observed more frequently than in former years. Although confined for the most part to the humid Southern Provinces, a few cases have also been seen amongst the natives in the drier Northern Provinces. In the opinion of the medical and sanitary officers this disease is on the increase, and often assumes a very virulent form. There were no cases of beri-beri seen in the prisons during the year. Among the natives of the Cross River the disease is not unknown.

The returns do not in any way represent the true incidence of venereal diseases in the community. Syphilis and gonorrhœa are common diseases all over Nigeria except in the pagan districts of the north, where the natives are reputed not to intermarry with those of other tribes. Helminthic infections are so prevalent that it would be difficult to find a native who does not harbour one at least of the three most common parasites. The percentage of the population infected with ankylostomiasis is very high—probably over 80 per cent. in certain areas—but the infection seldom produces clinical symptoms. It is believed to be often associated with severe cases of diarrhœa and dysentery.

The limitations which the advent of war had imposed upon sanitary activity in the course of the second half of 1914 remained throughout the whole of 1915. Under the circumstances the Northern Provinces should be accounted fortunate, as visitations of epidemic diseases were few. The most unfortunate sanitary legacy bequeathed by 1915 was the fact that it had become necessary to recognise enteric fever and tuberculosis as naturalised members of the community of endemic diseases. A European, a member of the medical staff, succumbed to the former. An improved water-supply has been provided for Lagos. Considerable attention was given during the year to the important question of segregation of the European population at many of the leading political and commercial centres. Definite areas were arranged and, although immediate results cannot be obtained in all instances, progress is gradually being made as opportunity arises and means become available.

In the Northern Provinces the principal hospitals and dispensaries are at Zungeru, Lokoja, Kaduna, and Kano. 812 Europeans and 15,887 natives were treated as out-patients and 325 Europeans and 4364 natives as in-patients; 14 Europeans and 200 natives died. In the Southern Provinces the chief hospitals and dispensaries are at Lagos, Warri, Calabar, Ibadan, and Onitsha. In

these there were treated during the year 411 Europeans and 76,872 natives as out-patients and 1656 Europeans and 9309 natives as in-patients; 12 Europeans and 760 natives died. The Leper Asylum at Yaba and the leper settlements at Ibusa, Onitsha, Okhanam, and Illah had 20, 133, 49, 65, and 32 inmates respectively during the year.

THE CULTIVATION OF JALAP.

To the Editor of THE LANCET.

SIR,—Among the herbs recommended for growing in England I should like to know if jalap has ever been tried. I first saw it in a Norfolk garden, and I now grow it as a creeper at my Hampshire cottage. It bears a beautiful convolvulus flower in the autumn. It produces a few tubercles each year, but I have no knowledge of their medicinal value.—I am, Sir, yours faithfully,

Devonshire-place, W., May 8th, 1917. GEO. H. SAVAGE.

*** The dried tubercles of jalap (*Ipomœa purga*) yield about 10 per cent. of official resin, containing jalapin and scammonin.—ED. L.

A LOST STETHOSCOPE.

To the Editor of THE LANCET.

SIR,—The other day a patient of mine was walking on Crow Lane, which is situated between Newton-le-Willows and Earlestown, when a rapidly-driven motor passed him, from which dropped an object that he brought to me.

It is a stethoscope made of nickel-plated material with the chest- and ear-pieces of pure tortoise-shell. I should say it was of more than ordinary value and should be pleased to forward it to any medical man who may have lost one answering to that description in this locality.

I am, Sir, yours faithfully,

M. C. S. LAWRANCE.

100, Market-street, Earlestown, Lancs., May 8th, 1917.

TWILIGHT SLEEP.

A CORRESPONDENT suggests that we should comment upon the advertisement methods of a nursing home where this treatment is in use, but it seems to us that the public will see at a glance what impression is intended to be produced.

Jupiter.—The administrative orders have recently been so frequently altered that reference to your Local Medical War Committee is the only course to be safely recommended.

METEOROLOGICAL READINGS.

(*Taken daily at 8.30 a.m. by Steward's Instruments.*)

THE LANCET Office, May 9th, 1917.

Date.	Rainfall.	Solar Radiation Vacuo.	Maximum Temp. Shade.	Min. Tem.	Wet Bulb.	Dry Bulb.	Remarks.
May 3	...	109	68	48	50	56	Fine
,, 4	...	113	74	48	53	58	Fine
,, 5	...	101	72	50	52	56	Cloudy
,, 6	...	96	65	40	39	45	Fine
,, 7	...	105	63	38	48	51	Fine
,, 8	...	103	64	40	45	50	Fine
,, 9	...	101	62	40	48	50	Fine

Other information which we have been accustomed to give in this "Readings" is withheld for the period of the war.

BOOKS, ETC., RECEIVED.

BRITISH ESPERANTO ASSOCIATION, 17, Hart-street, Bloomsbury, W.C.
Caroline Stephen's Fundamento de la Kvakerismo Esperantigita de Montagu C. Butler el la kvara eldono de la originalo. 1*s*, 9*d*

CASSELL AND CO., London.
A Handbook of Midwifery for Midwives, Maternity Nurses, and Obstetric Dressers. Fourth edition. By Comyns Berkeley, M.A., M.D., M.C. Cantab., F.R.C.P. Lond., M.R.C.S. Eng. 6*s*. net.
Notes on Military Orthopædics. By Colonel Robert Jones, C.B., Inspector of Military Orthopædics, A.M.S. With Introductory Note by Surgeon-General Sir Alfred Keogh, G.C.B., Director-General, A.M.S. 2*s*. 6*d*. net.

CHURCHILL, J. AND A., London.
Pulmonary Tuberculosis: its Diagnosis, Prevention, and Treatment. By W. M. Crofton, M.D. 6*s*. net.
Psychological Medicine: a Manual on Mental Diseases for Practitioners and Students. By Maurice Craig, M.A., M.D. Cantab., F.R.C.P. Lond. Third edition. 15*s*. net.

PUTNAM'S (G. P.) SONS, London and New York.
Hygiene in Mexico: A Study of Sanitary and Educational Problems. By Alberto J. Pani, C.E. Translated by Ernest L. de Gogorza.

The following journals, magazines, &c. have been received:—La Chirurgia degli Organi di Movimento, Annales al la Facultad de Medicina Montevideo, American Medicine, British Journal of Dermatology and Syphilis, Practitioner, Birmingham Medical Review, Annali d'Igiene, Archives of Internal Medicine, Pediatrics, British Journal of Ophthalmology, Transactions of the Society of Tropical Medicine and Hygiene, West London Medical Journal, British Journal of Dental Science, Annales de l'Institut Pasteur, British Dental Journal.

Medical Diary for the ensuing Week.

SOCIETIES.

ROYAL SOCIETY, Burlington House, London, W.
THURSDAY.—Bakerian Lecture:—Mr. J. H. Jeans: The Configuration of Astronomical Masses and the Figure of the Earth.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

Tuesday, May 15th.

GENERAL MEETING OF FELLOWS, at 5 P.M.
Ballot for Election to the Fellowship.

MEETINGS OF SECTIONS.

Tuesday, May 15th.

PSYCHIATRY (Hon. Secretaries—Bernard Hart, G. F. Barham): at 6 P.M.
Annual General Meeting.—Election of Officers and Council for 1917-1918.

Wednesday, May 16th.

HISTORY OF MEDICINE (Hon. Secretaries - J. D. Rolleston, Charles Singer): at 5 P.M.
Annual General Meeting.—Election of Officers and Council for 1917-1918.

Thursday, May 17th.

DERMATOLOGY (Hon. Secretaries—J. E. R. McDonagh, Henry MacCormac): at 5 P.M.
Annual General Meeting.—Election of Officers and Council for 1917-1918.
Cases will be shown at 4.30 P.M.

Friday, May 18th.

OTOLOGY (Hon. Secretaries—E. D. D. Davis, Somerville Hastings): at 5 P.M.
Annual General Meeting.—Election of Officers and Council for 1917-1918.
Cases and Specimens (at 4 P.M.):
Dr. Dan McKenzie and Dr. Robert Knox: The Anatomy of the Fallopian Canal.
Mr. J. F. O'Malley: The Escape of Cerebro-spinal Fluid from the Ear for Twelve Months.
Mr. W. H. Jewell: A Case of Unusual Tinnitus.
Discussion:
On "The Relation of Diseases of the Ear to Recruiting for the Army and Navy" will be opened by Capt. G. J. Jenkins.

ELECTRO-THERAPEUTICS (Hon. Secretaries—E. P. Cumberbatch, R. Knox): at 8.30 P.M.
Annual General Meeting.—Election of Officers and Council for 1917-1918.
Paper:
Dr. Mottram and Mr. Sidney Russ: A Contribution to the Study of Dosage in Radium Therapy.

MEDICAL SOCIETY OF LONDON, 11, Chandos-st., Cavendish-sq., W.
MONDAY.—8 P.M., General Meeting. Election of Officers for 1917-18 Session and to receive Annual Report. 9 P.M., Annual Oration:—Sir William Osler: The Anti-Venereal Campaign.

LONDON DERMATOLOGICAL SOCIETY, St. John's Hospital, 49, Leicester-square, W.C.
TUESDAY.—4.30 P.M., Clinical Meeting. Cases sent for Consultation. Demonstration of Pathological Specimens. Clinical Cases will be shown by Dr. H. C. Samuel, Dr. B. Winston, Capt. W. Griffith, R.A.M.C., Dr. B. James, Dr. W. K. Sibley, Dr. J. B. Ridley, and Dr. M. Dockrell.

ROYAL SOCIETY OF ARTS, John-street, Adelphi, W.C.
WEDNESDAY.—4.30 P.M., Paper:—Sir C. Arthur Pearson: The Blind Sufferers from the War and their Future Employment.

SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 11, Chandos-street, Cavendish-square, W.
FRIDAY.—5.30 P.M., Paper:—Read for Dr. H. R. Carter (Washington, U.S.A.): Spontaneous Disappearance of Yellow Fever from Failure of the Human Host.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.
MONDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye. Dr. Simson: Diseases of Women.
TUESDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.
WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.
THURSDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye.
FRIDAY.—10 A.M., Dr. Simson: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.
SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. Mr. B. Harman: Eye Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

ROYAL INSTITUTION OF GREAT BRITAIN, Albemarle-street, Piccadilly, W.
THURSDAY.—3 P.M., Prof. W. Bateson: The Chromosome Theory of Heredity and the Alternatives. (Lecture I.)

ROYAL INSTITUTE OF PUBLIC HEALTH, Lecture Hall of the Institute, 37, Russell-square, W.C. 1.
Course of Lectures and Discussions on Public Health Problems under War and After-war Conditions:—
WEDNESDAY.—4 P.M., Lecture V.:—Right Hon. Lord D'Abernon: Public Health and the Control of the Liquor Traffic. Followed by a discussion.

EDITORIAL NOTICES.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITOR," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention should be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Lectures, original articles, and reports should be written on one side of the paper only, *and when accompanied by blocks it is requested that the name of the author, and if possible of the article, should be written on the blocks to facilitate identification.*

We cannot undertake to return MSS. not used.

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MANAGER'S NOTICES.

ALTERATION IN THE PRICE OF "THE LANCET."

INCREASED war expenses and cost of production necessitate an increase of the price of THE LANCET. Commencing with the new year, the price was raised to 8*d*. The rates of subscription remain as revised in October.

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N.—Mr. A. E. Nicholls, Shrewsbury.

O.—Capt. E. A. O'Connor, R.A.M.C.; Mr. C. A. P. Osburne, Old Catton; Ontario Treasury Dept., Toronto.

P.—Dr. E. H. A. Pask, Ulverston; Messrs. Porteous and Co., Glasgow; Mr. Paterson, Llangwyfan.

R.—Royal Surrey County Hospital, Guildford, Sec. of; Mr. A. T. Roworth, Twickenham; Capt. F. B. Robson, R.A.M.C.; Ruxton, Brentford.

S.—Rev. J. B. Stedeford, Hull; Stretton House, Church Stretton, Medical Supt. of; Messrs Swete and Zietlinger, Amsterdam; Mr. D. Sen, Midnapur; Messrs. Saward, Baker, and Co., Lond.; Salford Royal Hospital, Sec. of; Messrs. Sherratt and Hughes, Lond.; S. B. K.; S. M. C.; Messrs. W. H. Smith and Son, Lond.; S. P. Charges Co., St. Helens; Sheffield Royal Hospital, Sec. of; Lieut. A. Sunderland, R.A.M.C.; Mr. G. Souter, Dingwall.

T.—Mr. J. Thin, Edinburgh; Messrs. Tucker and Blades, Bristol; Dr. K. Taylor.

V.—Victoria Hospital for Sick Children, Hull, Sec. of.

W.—Miss Wilson, Birmingham; Wolverhampton and Staffordshire General Hospital, Sec. of; Wilts County Council Education Committee, Trowbridge, Acct. to the; Wigan Infirmary, Sec. of; W. A. B.